Contents

Copyright and Declaration

Thank you very much for your purchase of UC-1800 automatic urine analyzer.

All contents in this manual were strictly compiled according to the related laws and regulations in china, as well as the specific condition of UC-1800 automatic urine analyzer, covering all the updated information before printing. URIT is fully responsible for the revision and explanation of the manual, and reserves the right to renovate the relevant contents without separate notice. Some of the demonstration pictures in this manual are for reference and subject to real object if any differences.

All instructions must be followed strictly in operation. In no event should URIT be responsible for failures, errors and other liabilities resulting from user's noncompliance with the procedures and precautions outlined herein.

Limitation of liability

URIT warrants to the original purchaser that this instrument will be free from defects in materials and workmanship for a period of one year from the later of the date of original purchase or installation.

URIT assumes no liability in the following situations even during the period of warranty.

1. Failure due to abuse the instrument or neglect the maintenance.
2. Use reagents and accessories other than manufactured or recommended by URIT.
3. Failure due to operation not under the instructions described in the manual.
4. Replace accessories not specified by URIT, or after maintenance or repair by a service agent not approved or authorized by URIT.

NOTE:

URIT makes no warranties, either express or implied, as to product quality, performance, and value as a commodity or applicability for any particular purpose. Technical service and troubleshooting are provided by URIT. If the instrument has malfunction, please contact the agency authorized by URIT.

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Rx Only

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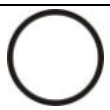
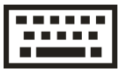
Preface

This operation manual describes in detail the principle, structure, operation, maintenance and troubleshooting concerning UC-1800 automatic urine analyzer. User should follow the instructions presented in this manual.

Meaning of Markings

Followings are the markings that appear on the instrument or label.

 Electric shock hazard	 Caution	 Biological risks
 Power on	 Power off	 Grounded
 In Vitro Diagnostic medical device	 Alternating current	 Serial number
 Laser hazard	 Electrical and electronic products recycling symbol	 CE mark
 Up	 Fragile	 Keep away from rain
 Stacking limit	 No rolling	 Consult operation manual
 Series Interface	 Ethernet interface	 USB interface
 Mouse	 Keyboard	 Prick the hand, keep hands away
 Protect from heat	 Environment-Friendly Use Period	 Date of manufacture
 Use by date	 Fuse	

EMC

- **This Instrument complies with the emission and immunity requirements specified in IEC 61326-2-6:2020、IEC 61326-1:2020、EN IEC 61326-2-6:2021、EN IEC 61326-1:2021、IEC 60601-1-2:2014+AMD1:2020 and IEC TR 60601-4-2:2016.See Appendix 8 for details.**
- **The environment in which this device is intended to be used includes typical health care Settings (hospitals, clinics, doctor's offices, etc.).**
- **This Instrument is designed and tested as Class A equipment . In a domestic environment, this Instrument may cause radio interference, and protective measures shall be taken.**
- **It is recommended to evaluate the electromagnetic environment before use of the Instrument.**
- **Don't use this Instrument near strong radiation sources (such as unshielded RF sources), otherwise it may interfere with the normal operation of the Instrument.**

Caution

- **The manufacturer is responsible for providing the electromagnetic compatibility information of the product to the customer or user.**
- **The user is responsible for ensuring the electromagnetic compatibility of the product, so that the product can work properly.**
- **With the exception of cables sold by the manufacturer of the equipment or system as spare parts for internal components, the use of accessories and cables other than those specified may result in increased emission or reduced immunity of the equipment or system.**
- **The device or system should not be used in close proximity to or stacked with other devices, and if it must be used in close proximity or stacked, it should be observed to verify that it operates properly under the configuration used.**

- **FCC ID: 2AZS3UYUC1800**
- **This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.**

- **Changes or modifications not expressly approved by the party responsible for compliance could void the user’ s authority to operate the equipment.**

- **Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:**

  1) **Reorient or relocate the receiving antenna**
  2) **Increase the separation between the equipment and receiver**
  3) **Connect the equipment into an outlet on a circuit different from that to which the receiver is connected**
  4) **Consult the dealer or an experienced radio/TV technician for help.**

1. GENERAL INFORMATION

UC-1800 Automatic Urine Analyzer (instrument for short) is characterized by fully automated and simple operation. All you need to do is to set test strips and samples, press the START key, and the rest of operations are fully automated with UC-1800, which can measure samples continuously. For each measurement, the instrument automatically performs a series of operation: sample transmitting, sample aspirating, sample dropping, rinsing, strip sorting, strip feeding and color identifying, etc. The instrument is used in conjunction with a serials of URIT urine test strips (test strip for short) for measuring 13 parameters. Measure results are printed through either built-in printer or external printer.

Intended use: The UC-1800 Automatic Urine Analyzer is automated instruments which are intended for professional, in vitro diagnostic use only.

Depending on the reagent strips being used, the instruments perform semi-quantitative detection of the following analytes in urine: ascorbic acid, microalbumin, leukocytes, creatinine, ketone, urobilinogen, bilirubin, glucose, protein, specific gravity, blood and pH in urine and for qualitative determination of nitrite in urine. The urine hydrometer (optional) can determine the specific gravity, color and turbidity of urine. Test results may provide reference for clinical examination and diagnosis..

Contraindications: None

Note: The measurement accuracy of the instrument is guaranteed only when it is used with the **URIT** urine test strips and detergent. Please read the instruction manual of the urine test strip and detergent carefully before use.

1.1 Characteristic

1. Measurement mode: normal measurement, emergency measurement, QC measurement, online mode.
2. Measurement items:ascorbic acid, leukocytes, ketone, nitrite, urobilinogen, bilirubin, protein, glucose, specific gravity, blood, pH, creatinine, Microalbumin,etc. The urine hydrometer (optional) can determine the specific gravity, color and turbidity of urine.
3. Operate automatically: automatic feed test strips, automatic transmission samples, samples aspiration, samples dropping, clean, and collection of waste strips and liquid.
4. Dropping: accurate quantitative dropping to avoid cross-contamination between measure items.
5. Query: query historical measuring results and QC results.
6. Display: provide Chinese and English menus, operation (status indication, operation prompt, measuring result, etc.) can be displayed on the LCD monitor, and the measuring data can be printed by the built-in printer or external printer.
7. System upgrade: upgrade system with U disk.
8. Data transmission connection mode: The serial port can be directly connected to the computer, and the Ethernet interface can be connected to the hospital network.
9. Sampler installation method: portable bayonet installation, easy to disassemble and install and routine maintenance.
10. Filling method of strip: the whole cylinder is side-filled.
11. Strip Feeding Mode: roller feeding.
12. Sample identification method: photoelectric sensors identify sample tubes.
13. Sample dropping method: matrix high-speed dropping and accurate quantitative dropping to avoid cross-contamination between measure items.
14. Sample probe transmission mode: high precision linear guide transmission.

15. Strips discarding method: automatically collect discarded test strips.
16. Sample probe cleaning method: four-way spray cleaning can improve the cleaning effect, ensure the external and internal walls of the sample probe are clean, and there is no residual liquid on the outside of the probe, so as to avoid cross contamination between urine samples.
17. Specific gravity correction function: The specific gravity value is automatically corrected by the pH detection value.
18. Color urine correction function: Eliminate the influence of color urine by detecting the blank reagent block of the test strip.
19. Temperature correction function: automatically correct the measuring result by detecting the internal temperature of the instrument.
20. Automatic enhanced cleaning function: automatically enhance the cleaning of high turbidity samples.
21. Mixing function: the sample can be mixed.
22. Fault alarm function: when there is a fault, the instrument will emit a beeping sound to alarm.
23. Real-time monitoring function of consumables status: it can monitor the status of detergent and waste liquid in real time.
24. Automatic identification of test tube rack number: It can automatically identify the number code on the right side of the test tube rack, which is convenient for customers to review.
25. Function of ST module and YC module: there are connecting interfaces for sample preprocessing module (ST module) and tested tube racks storage module(YC module).(optional)
26. Closed sampling function: the sample can be collected in closed tubes(puncture sampling), without opening the cap manually.
27. Barcode recognition: barcode scanning identifies the barcode on the tube. (optional function)
28. Sample detection function: the instrument uses liquid level sensing technology, and will display prompt information when the sample is insufficient.
29. Hydrometer test function: the specific gravity value of the sample can be measured.(optional function)
30. Turbidimeter test function: the turbidity of the sample can be analyzed. (optional function)
31. Color recognition function: It can identify the color of the sample. (optional function)
32. Online function: after installing the online bridge, it can work online with the automatic urine sediment analyzer. (optional function)
33. The function of not dropping the sample on the strip: it can prompt the sample on the strip.
34. The function of controlling temperature of measuring area: it can keep the temperature constant in strips measuring area.
35. Real-time monitoring function of waste strip: it can monitor the status of waste strip in real time.
36. Image display function of strip: It can capture, display and store the image of urine strip after sample dropping.
37. Precision: coefficient of variation (CV, %) of analyzer reflectance measuring results ≤ 0.9%.
38. Accuracy of the test strip with the adapted urine analyzer: the difference between the measuring result and the reference value of the corresponding reference solution does not exceed one order of magnitude, and there shall be no reverse difference. There is no negative result for the

positive reference solution and no positive result for the negative reference solution.

39. Stability: The coefficient of variation (CV, %) of the reflectance measuring results is less than or equal to 0.9% within 8 hours after the analyzer is turned on.
40. Carryover: Measure positive samples of the highest concentration results of each measure item except specific gravity and pH, and then measure negative samples, but negative samples have no positive results.

1.2 Specifications

1. Measurement principle:

   Urine test strip: reflective photoelectric colorimetry. Hydrometer: refractometer method

   Turbidity meter: scattering method+transmission method. Color: RGB three primary color method

2. Measurement wavelength: 720nm, 620nm, 570nm, 550nm, 470nm.
3. Measurement system: using CIS contact image sensor detection system.
4. Applicable test strip: URIT 11FA，URIT 12FA.
5. Measurement speed: up to 480 / h.
6. Urine requirements: at least 2mL.
7. Maximum capacity of to be measured samples : 26 to be measured tubes and 260 to be measured samples.
8. A single test tube rack contains 10 samples at a time.
9. Maximum filling amount of single strip: 500 pieces.
10. Waste box capacity: it can hold 500 pieces of waste strips
11. Display: 10.4-inch touch color LCD
12. Input and output ports: PS/2 interface, serial port, Ethernet interface, USB interface
13. Printer: Built-in thermal printer or external USB printer
14. Data storage: 2 million sample data and 100,000 sample pictures.
15. Use period: 10 years.
16. Power:100VA-200VA.
17. Size: 653mm×641mm×570mm (Length × width × height).
18. Weight: 75kg.
19. Working environment:

    Normal use temperature: 5℃- 40℃

    Recommended temperature: 15℃ - 30℃ (for the best use temperature, please refer to the instruction manual of the test strip for details)

    Humidity: ≤80%

20. The power supply: 100V-240V ~ 50/60Hz.
21. Atmospheric pressure: 86kPa ~ 106kPa

1.3 Structure

The analyzer consists of an automatic sample injection mechanism, an automatic selection mechanism, a test strip transmission mechanism, a fluid mechanism, an optical system, a central processing unit, a waste collection mechanism, an analytical processing software, a display screen and a printer.

Front of instrument (Figure 1-1)

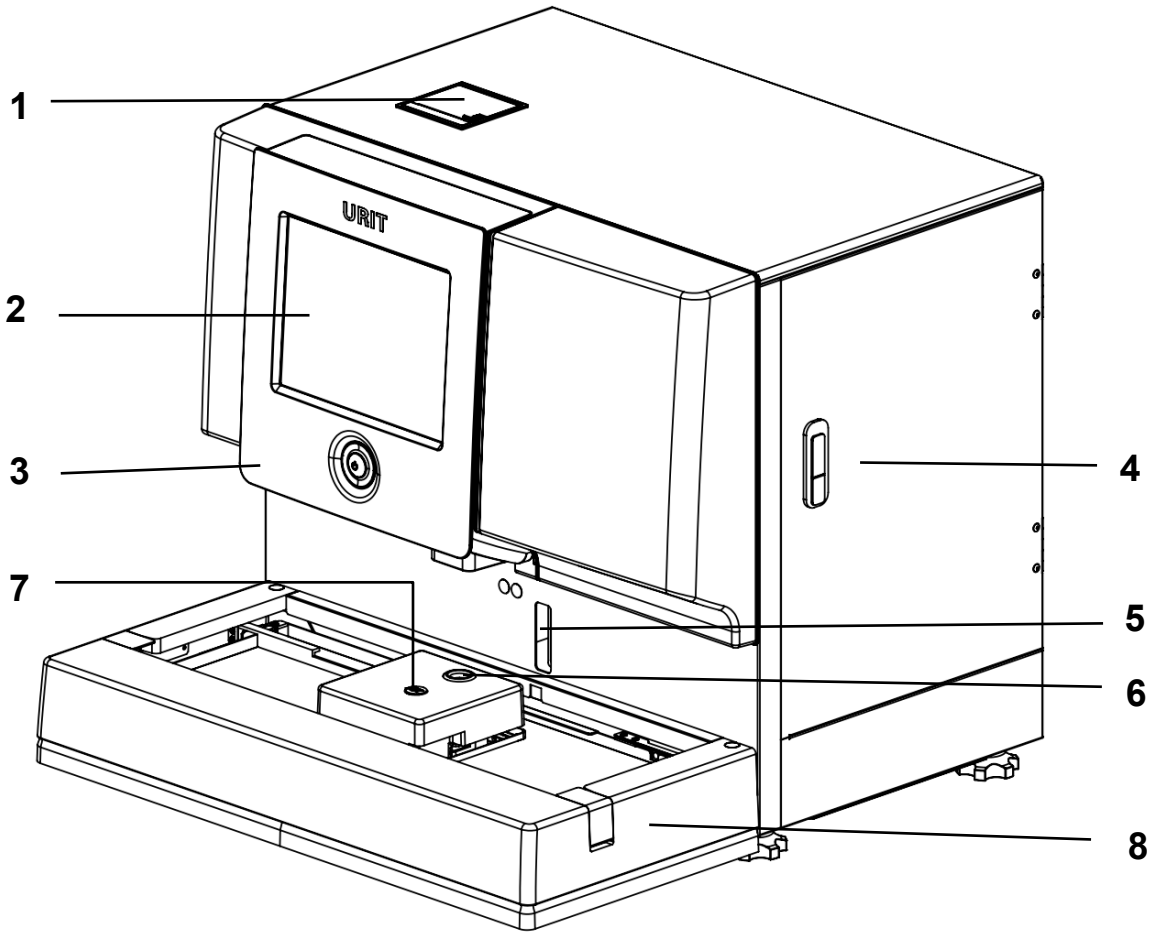


Figure 1-1

1. Built-in printer and cover: print result.
2. 10.4-inch touch screen: it can display interface and measuring information. The user can operate the instrument by touching the display to perform the corresponding work.
3. START button: press this button to start the instrument.
4. Right front shell of the instrument: The inside is the selection mechanism of the test strip. After the sealing cap of the strip selection mechanism is opened, the test strip can be placed therein.
5. Barcode scanning port: it is used to scan the barcode on the test tube.

6. Emergency measurement tube position: it is used for emergency measurement tube placement.
7. Emergency button: press this button for emergency measurement.
8. Test tube rack sampling mechanism: it is used to place the test tube rack for normal measurement.

The back of the instrument (Figure 1-2)

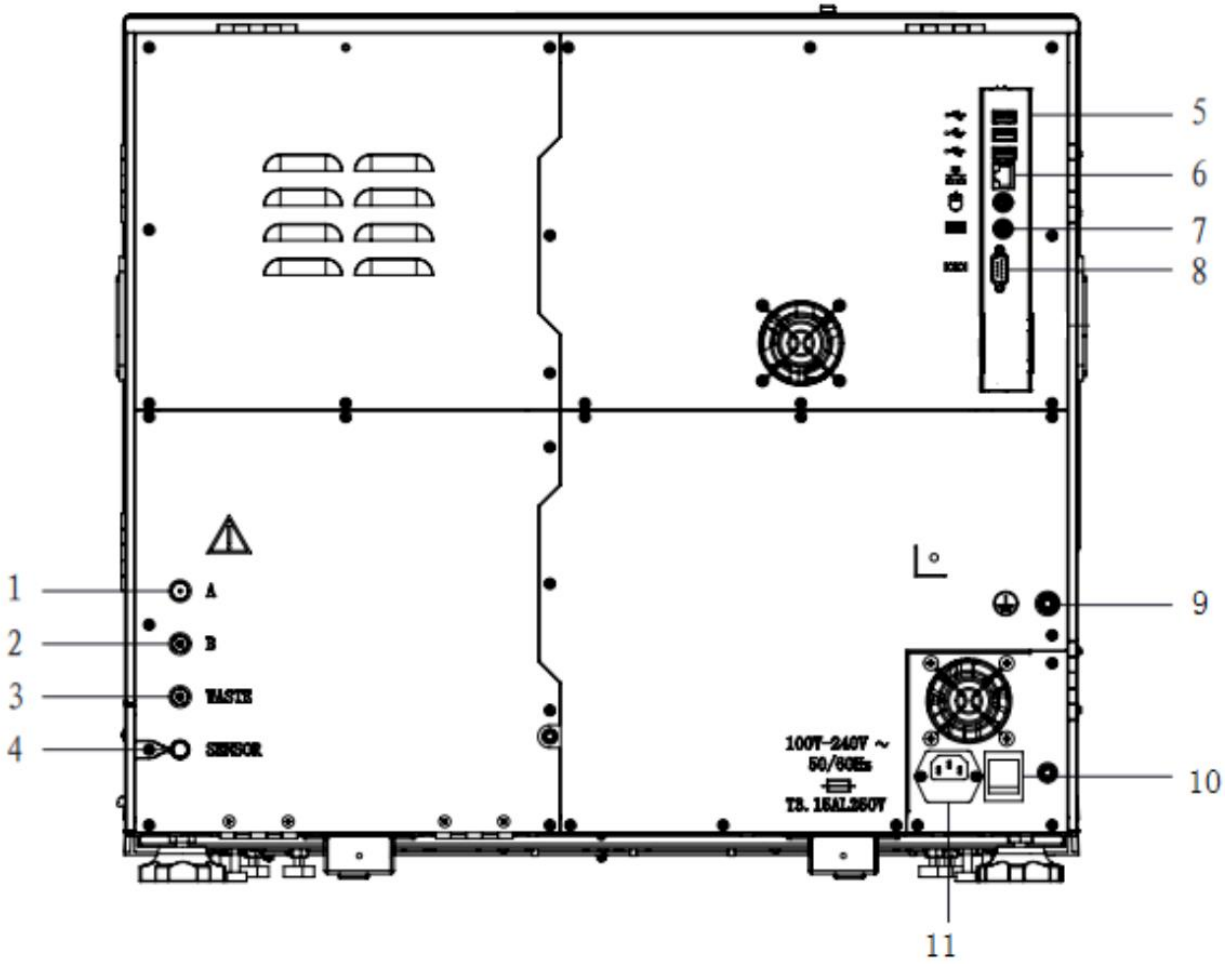


Figure 1-2

1. Detergent A inlet interface: The detergent is delivered to the instrument through this interface. (product model: URIT D21/URIT D21N)
2. Detergent B inlet interface: The detergent is delivered to the instrument through this interface. (product model: URIT D22)
3. Waste liquid outlet: Discharge waste liquid through this interface.
4. Waste liquid level sensor interface: It is for external connection of waste liquid bottle liquid level sensor.
5. USB interface: It is used to connect USB devices and output data.
6. Ethernet interface: It is used to connect the output data of the network line.
7. Mouse and keyboard interface: It is for external mouse and keyboard.
8. Serial port: standard 9-pin RS232 communication serial port socket for outputting data or

communication when online.

9. Protective grounding interface: it is used to connect the ground wire to protect the ground.
10. Power switch: turn on or off the power of the instrument.
11. Power input port: IEC standard three-wire power plug with fuse holder.

> **Caution**
>
> **Be sure to install the external interface of the instrument when the instrument is turned off, so as not to cause the instrument damage or malfunction.**

1.4 Measurement Principle

1.4.1 Test strip measurement principle

Measurement of test strips is done by the reflectance photometry method，using CIS (contact image sensor) image scanning analysis technology to detect.

Placing tube racks loaded with samples on the rack injection mechanism and clicking the START key, the instrument will automatically perform a series of operations, such as transmitting samples, selecting strips, reading barcode, aspirating samples, dropping samples, measuring samples and printing results, until all tube racks are done. During the measurement, the reacted pads on strip (calibration pad is not involved in reaction, just for reference) will change colors as a result of chemical reaction within 60 seconds. Then the optical mechanism will compare the reflective light amount of each reacted pad with the reflective light amount of the calibration pad. The concentrations of analyzes will be calculated by CPU and printed together with semi-quantitative symbols. The instrument scans each reacted pad, and uses the image analysis technique and the photoelectric colorimetric technique to produce the semi-quantitative result value.

The dry chemical detection system of the instrument uses CIS image sensor, which is composed of a row of photoelectric sensor array, LED light source array and cylindrical lens array and other components. During detection, the test strip passes through the sensor detection area at a uniform speed, and the LED light source array gets a specific monochromatic light by switching the light source of different wavelengths and illuminates it on the test strip. The darker the color, the larger the value of absorbed light, the smaller the value of reflected light, and the smaller reflectivity, vice versa. That is, the degree of the color is proportional to the concentration of various components in the urine sample.

The light of the reacted pad is reflected into the photoelectric sensor array, and the light signal is converted into the current signal, which completes the photoelectric conversion. The intensity of the current is related to the intensity of light reflection. The current signal is sent through I/V conversion into the CPU for processing. By scanning the test strips comprehensively, the reaction image was obtained, and the image analysis and reflectivity calculation are carried out to obtain the detection results.

$$R\% = \frac{Tm \cdot Cs}{Ts \cdot Cm} \times 100\%$$

R: Reflectance

Tm: Reflective light amount at the reactive pad with the measurement wavelength

Ts: Reflective light amount at the reactive pad with the reference wavelength

Cm: Reflective light amount at the calibration pad with the measurement wavelength

Cs: Reflective light amount at the calibration pad with the reference wavelength

1.4.2 Specific gravity measurement principle

Specific gravity measurement method is refractometer, which using the correlation between light refractive index and total solids in the solution to determine.

Refractometer method, available at 15 ℃ ~ 38 ℃ temperature range of use, before use can be calibrated by the temperature compensation device; available for use the known standard high specific gravity concentration solution and standard low specific gravity deionized water to calibrate; easy to standardization, less quantity of samples, especially suitable for patients with oliguria and pediatric patients. Refractometer method is recommended as reference method by Clinical Laboratory Standard Institution, CLSI and Chinese Committee for Clinical Laboratory Standards, CCCLS.

Specific gravity is based on the principle of different concentrations of urine sample which have different refractive indexes to measure, that is uses the same wavelength of monochromatic parallel light comes into the triple prism which contains urine sample, and then according to position of refracted ray in photoelectric technology detector（displacement sensor）to determine the specific gravity value. Specific gravity measurement principle functional block diagram is shown in Figure 1-3 below.

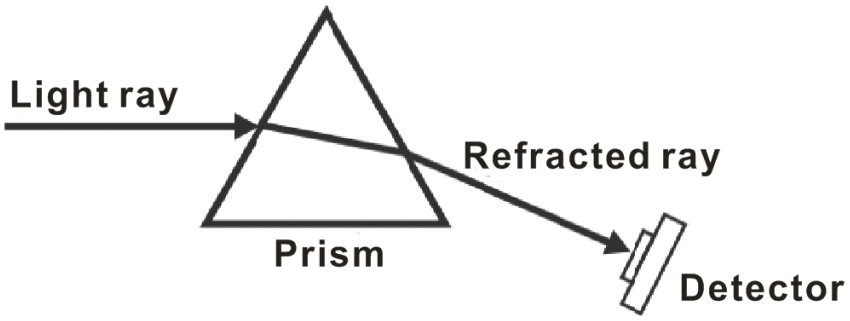


Figure 1-3 Specific gravity measurement principle

Specific gravity results are calculated by the following formulas:

$SG_X = (SG_H - SG_L) \cdot (K_X - K_L) / (K_H - K_L) + SG_L$ (Formula 1)

Formula 1 can change to: $\frac{SG_X - SG_L}{SG_H - SG_L} = \frac{K_X - K_L}{K_H - K_L}$ (relationship between them is linear)

SG_H : The specific gravity of high concentration solution

SG_L : The specific gravity of low concentration solution

SG_X : The specific gravity of sample solution

K_H : High concentration solution position coefficient

K_L : Low concentration solution position coefficient

K_X : Sample solution position coefficient

Position coefficient: It is calculated by the detector output data, and has a linear relationship with the refractive index.

Refractive index change depends on the temperature of the sample solution, and the specific gravity value is using the following formula to correct.

$SG_t = SG_X + (T_{SAM} - T_{STD})\ C_t$ (Formula 2)

SG_t : The specific gravity of high concentration solution

SG_X : The specific gravity of low concentration solution

T_{SAM} : The temperature of sample solution

T_{STD} : The temperature of low concentration solution

C_t : Temperature coefficient (SG 0.001/3° C) (temperature coefficient)

If the urine sample contains large amounts of glucose or protein, then the specific gravity will be affected, according to WS/T 229-229 “Physical, chemical and microscopic examination of urine” 5.4.1 requirements: 1 g/L protein will increase urine specific gravity 0.0003, 1 g/L glucose will increase urine specific gravity 0.0004. So the specific gravity results will be corrected through the glucose and protein level which was measured by the test strip.

SG = $SG_t - C_{GLU} - C_{PRO}$ (Formula 3)

SG: Specific gravity value which after the temperature compensation

SG_t : Specific gravity value which gets from formula 2

C_{GLU} : Glucose correction value

C_{PRO} : Protein correction value

1.4.3 Turbidity measurement principle

Turbidity was measured by scattering light and transmission light comparison method. This method can simultaneously measure the intensity of the scattered light and the transmitted light, and then measure the turbidity according to the ratio of the intensity. Based on Lambert-Beer law and the law of scattering, it can eliminate the light aging influence on measurement accuracy, and can correct the interference caused by color or light-absorbing materials, reduce the drift, and give full play to the advantages of scattering method and transmission method. It can provide a measurement method suitable for low turbidity to high turbidity solution, and effectively improve the adaptability and accuracy of the measurement. Turbidity module emits light to make it go through the sample, and then measures the intensity of scattered light at an direction of 90° to the incident light and transmitted light at a direction of 180° to the incident light. The turbidity value is calculated according to the ratio of the intensity of scattered light to transmitted light. Turbidity measurement schematic diagram is shown in Figure 1-4 below.

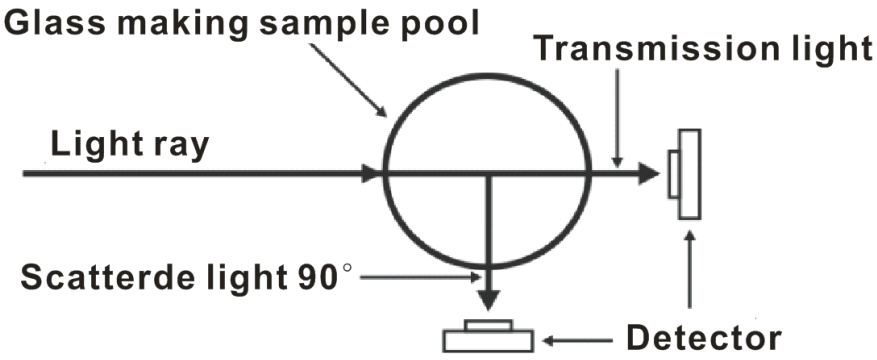


Figure 1-4 Turbidity measurement principle

Turbidity result is calculated by the following formula:

T = (Ss / Ts - Sw / Tw) / K

T: Turbidity level

Ss: Sample scattered light level

Ts: Sample transmission light level

Sw: Flushing fluid scattered light level

Tw: Flushing fluid transmission light level

K: Coefficient factor

1.4.4 Color measurement principle

The color is detected by RGB primary color method. Primary colors are the “basic color” which cannot be gotten by other colors mixed. But mix the primary colors in different proportion will get other new colors. Three primary colors of light are RGB (Red, Green, and Blue). Equivalent red light +green light=yellow light, green light +blue light = cyan light. Equivalent red light +blue light = magenta light, equivalent red +green+ blue=white, and if the intensity of these three light is zero, it is black (dark).

When the white light passes through colored solution, the non-solution colors light will be absorbed, so the color of the light through the solution can be expressed as the color of the solution, and then the solution color can be detected by the professional color recognition sensor (filter) which in the back-end of the solution.

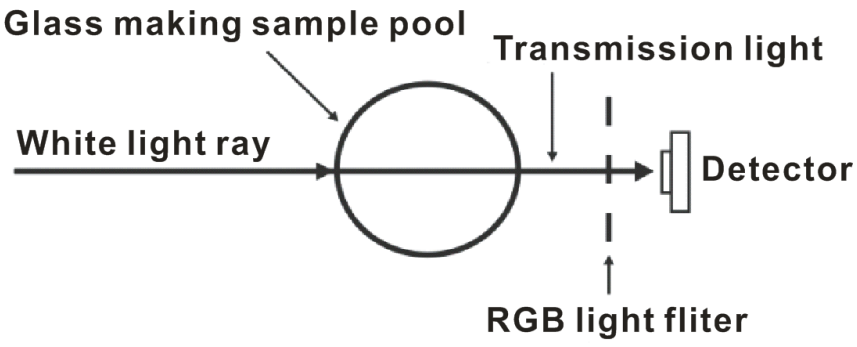


Figure1-5 Principle of color detectio

2. Instrument installation

Caution

The instrument must be installed by our company's professionals or authorized personnel of our company.

2.1 Inspection

After the customer receives the goods, please follow the following procedures for unpacking and inspection:

1. Open the packing box and take out the instrument and accessories;

2. According to the attached packing list, accept the instrument, the number and condition of the instrument;

3. If the quantity does not match or components are damaged, please contact the distribution department or the URIT MEDICAL ELECTRONIC CO., LTD.

The items in the instrument package are as follows:

SN.	Item	Quantity	Remark
1	Automatic Urine Analyzer	1	UC-1800
2	Operation Manual	1	In accessory box
3	Detergent bottle	1	in wooden package
4	Waste liquid bottle	1	in wooden package
5	Network Cable	1	In accessory box
6	Urine Analyzer Test Tube Rack	10	In accessory box
7	Test tube	100	In accessory box
8	One-way valve	1	In accessory box
9	Filter	1	In accessory box
10	Power cord	1	In accessory box
11	Printing paper	2	In accessory box
12	Fluid tube for maintenance	1	Figure 9,plastic tubeADF00005（3 / 32×7 / 32）、silicone tube 3*5、plastic tube ABH02007（1/8X1/4INCH） （one meter for each tube， in accessory box）
13	Large pump	1	In accessory box
14	Fuse	2	T3.15AL 250V. In accessory box

15	Serial line	1	In accessory box
16	Verification test strip	2	In accessory box
17	Steel needle for unblocking	1	In accessory box
18	Soft needle for unblocking	1	In accessory box
19	Brush for maintenance	1	In accessory box
20	Grease for maintenance	1	In accessory box
21	3 meters ground wire	1	In accessory box
22	SZ module	1	Optional,in wooden package
23	SS module	1	in wooden package
24	Side door switch key	2	In accessory box
25	Left connecting board	1	Optional (including 8 socket head cap screws for each)
26	Right connecting board	1	Optional
27	Detergent A tube	1	In accessory box
28	Detergent B tube	1	In accessory box
29	Waste liquid tube	1	With sensor. In accessory box
30	Small test tube holder	100	In accessory box
31	Small test tube fastener	100	In accessory box
32	Certificate of Quality	1	In accessory box

Caution

Please keep the attached accessories in a safe place.

2.2 Installation requirements

1. For indoor installation only, the room should be well ventilated and as dust-free as possible.

2. The instrument should be installed on a clean, leveling and stable water platform. The size should be at least 900mm×670mm. The space on the left side of the instrument should be at least 200mm. It is convenient to take out the waste box and conveniently turn off the power of the instrument. If the instrument needs to be online, sufficient space should be reserved according to actual needs to place the on-line product. The instrument should avoid being used in direct sunlight, strong magnetic field interference and splash.

3. The instrument should avoid being close to oven, heat source, radiation source and strong magnetic field source. Avoid excessive dust erosion; At the same time avoid on the table or refrigerator with vibration; Avoid exposure to corrosive and flammable gases.

Caution

(1) This Instrument complies with the emission and immunity requirements specified in IEC 61326-2-6:2020、IEC 61326-1:2020、EN IEC 61326-2-6:2021 and EN IEC 61326-1:2021.

(2) This Instrument is designed and tested as Class A equipment . In a domestic environment, this Instrument may cause radio interference, and protective measures shall be taken.

(3) It is recommended to evaluate the electromagnetic environment before use of the Instrument.

(4) Don't use this Instrument near strong radiation sources (such as unshielded RF sources), otherwise it may interfere with the normal operation of the Instrument.

4. Power supply: AC 100V-240V~, 50/60Hz, three-core power supply, good grounding.

5. The distance between the power socket and the instrument should be less than 5 meters. The power socket must be well grounded. The maximum power consumption of the power socket is 1kVA. If possible, the instrument should be connected to a dedicated line.

6. The instrument should be protected from prolonged exposure to excessive humidity and high temperatures. It is best to install in a room where the temperature and humidity of the air-conditioning unit meet the technical requirements of the instrument. In order to ensure the accuracy of the measuring results, please keep the temperature and humidity of the studio consistent with the environmental conditions required for the urine test strips used.

Caution

If the environment in which the instrument is used cannot meet the requirements specified in the urine test strip used, the accuracy of the measuring results cannot be guaranteed.

2.3 Installation steps

2.3.1 Instrument installation

1. Take the instrument out of the package and place it on the installation platform (the installation platform is horizontal and flat, the size is at least 900mm × 670mm, and the space on the left side of the instrument should be at least 200mm to facilitate the removal of the waste box. If the instrument is equipped with ST module and YC module, the platform size shall be at least 1300 mm × 670 mm. If the instrument needs online use, sufficient space should be reserved according to actual needs to place the online product.), the test tube rack injection mechanism and the host part are correct. Connect and confirm that the buckle of the test tube rack injection mechanism is properly inserted into the snap groove of the main unit. After the test tube rack sample injection mechanism is properly installed, it should be stable and parallel with the main part and ensure the level. The fixed machine foot of the test tube rack injection mechanism should contact the surface of the mounting platform to support the machine. If the requirements are not met, adjust the height by rotating its feet.

2. Open the right front shell of the instrument, turn the knob on the left side of the screen cover counterclockwise (see Figure 2-1-1), open the screen cover, and remove the fixed accessories on the sample probe rack. After removal, close and fasten the screen cover, rotate the left knob of the screen cover clockwise, and lock the screen cover.

Caution

- The instrument must be turned off before opening the display cover and side cover.
- Non-professionals or non-authorized personnel are not allowed to open the display cover and side cover at will, so as to avoid damage to personnel and instruments!

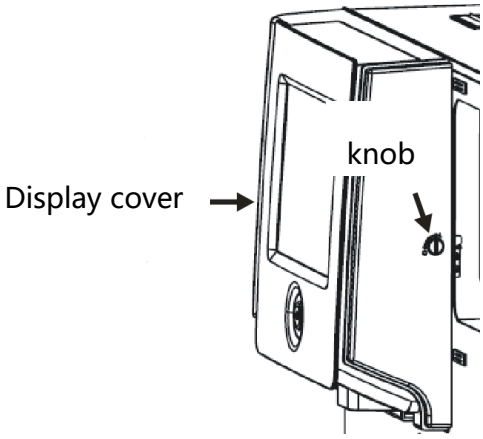


Figure 2-1-1

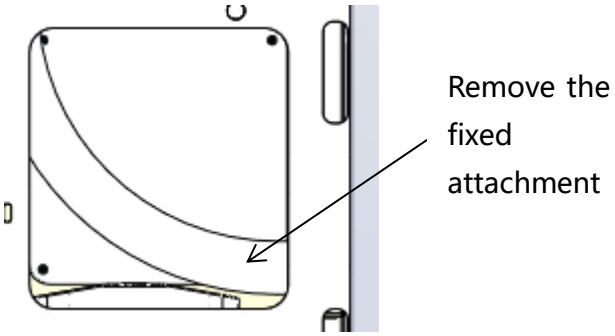


Figure 2-1-2

3. Open the right front shell of the instrument and remove the fixed attachment on the upper cover of the selection mechanism; Use the side cover switch key to open the side cover on the right side of the instrument(see Figure 2-2), remove the screws on the selection mechanism (see Figure 2-3), remove the side cover, and close the side cover switch to lock the side cover.

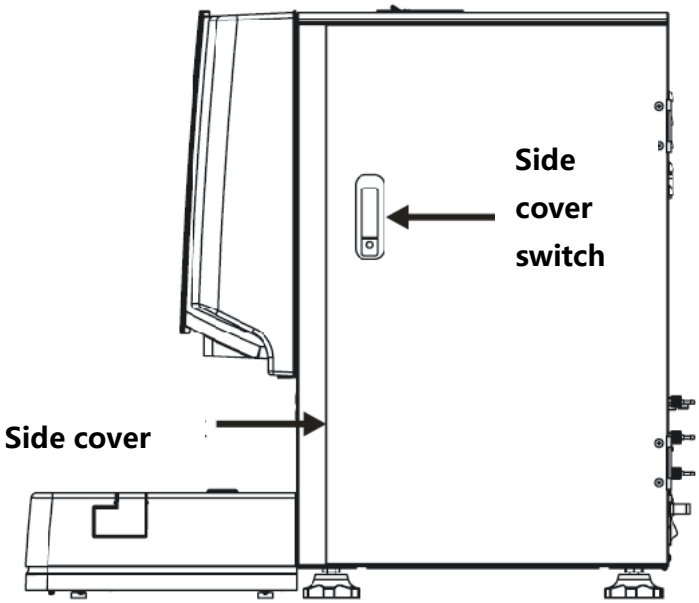


Figure 2-2

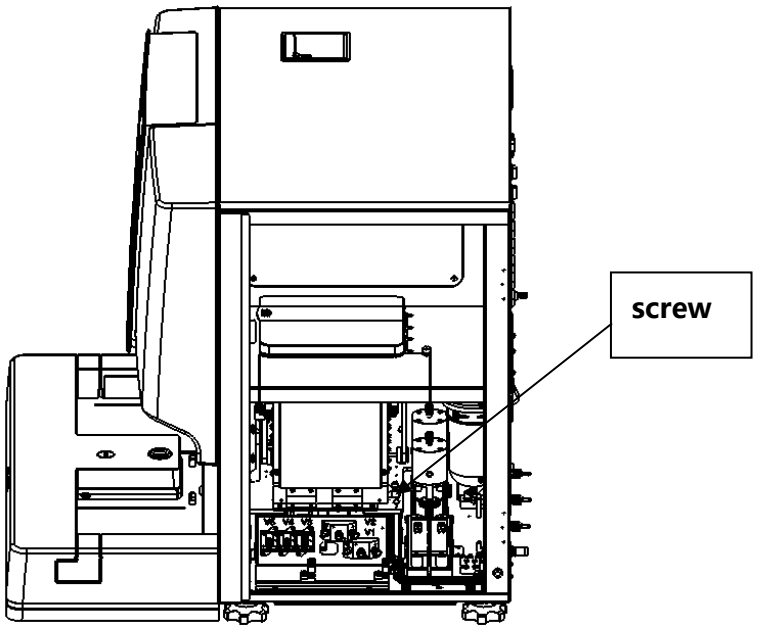


Figure 2-3

4. Install the detergent A, detergent B and waste liquid tubing: connect the detergent A tube to detergent A inlet connector on the instrument, and fix the other end in the bottle of URIT D21/URIT D21N; connect the detergent B tube to detergent B inlet connector on the instrument, and fix the other end in the bottle of URIT D22. Connect one end of the waste liquid tube to the instrument waste liquid outlet connector, and fix the other end in the waste liquid bottle. Connect the liquid level sensor on the waste liquid bottle to the instrument liquid waste level sensor interface.

5. Connect one end of the grounding wire to the protective grounding connector on the back of the instrument, and the other end to the grounding wire of the power supply; plug the power cable into the power connector on the back of the instrument host, and connect the other end to the AC 100V-240V~, 50/60Hz power socket.

6. When the instrument is running for the first time, check whether the detergent tube, and the waste liquid tube are bent, whether the liquid circulation is smooth, whether the waste can be discharged into the waste bottle, and whether the instrument can take detergent from the bottle.

2.3.2 Installation of ST module and YC module

If the instrument is equipped with ST module and YC module, please install them as follows:

1. Adjust the machine legs of the bridge transition module, ST module and YC module, so that it is in line with the height of the test tube rack sampling mechanism of the instrument.

2. Align the bridge notch of ST module with the notch on the right side of the sample tube rack injection mechanism, so that the to be measured tube rack can smoothly cross the bridge.

3. Adjust the position of YC module so that the notch of the bridge transition module and the bridge notch of YC module are aligned with injection port of the test tube rack sampling mechanism, so that the tested tube racks can pass smoothly.

4. Connect the Ethernet interface reliably to the online instrument network port with network cables (see Figure 2-4).

Caution

- The instrument must be turned off when installing the network cables!

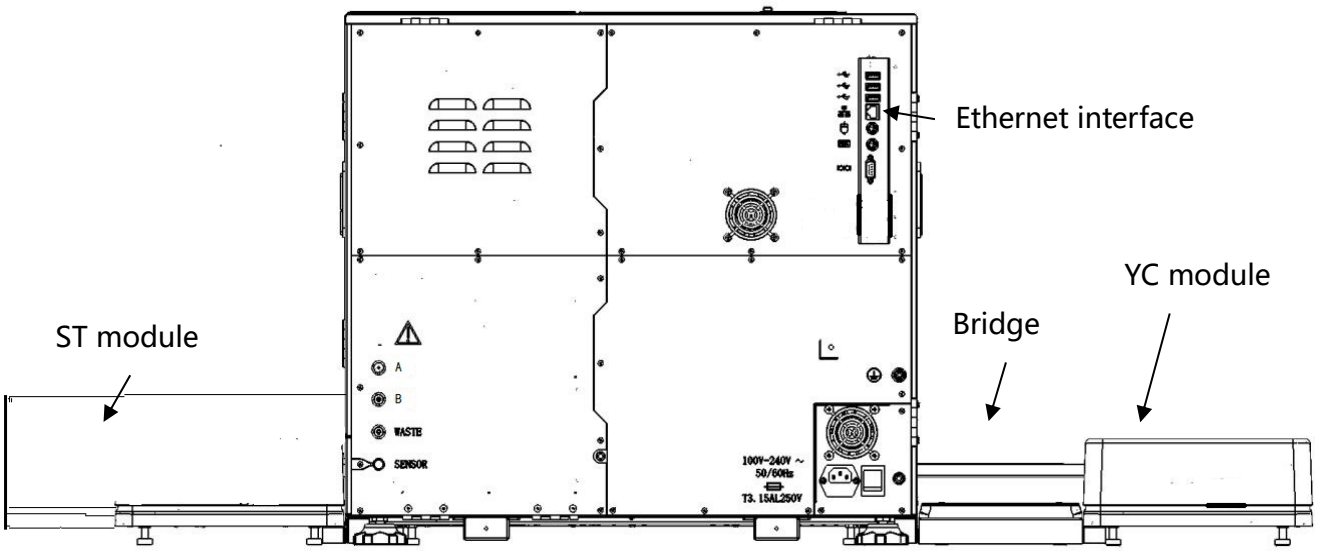


Figure **2-4**

5. After installation, start the instrument. If the ST module and YC module need to be enabled, click [Setting] → [General] → [Measure]→ [Online] button and select “UD-1300”.

3. FUNCTIONS

3.1 Self-check

The system starts with self-check and initialization when turning on the instrument power switch. If error is detected during the self-check process, relative hint or message will be displayed on the screen.

3.2 Display

Menus, hints, operation information and measure results are displayed on the 10.4-inch LCD. Measuring results can be indicated with four kinds of expression: Symbol unit, International unit, Traditional unit or English description.

3.3 Print

At the end of each measurement, results will be printed automatically through the built-in printer or the external printer (external printer is optional). Also, you can specify measuring results to print from the “Data” screen.

3.4 Storage and review

All measure results will be stored into memory automatically after measurement and can be reviewed from the “Data” screen.

3.5 Barcode recognition function (optional function)

The instrument is equipped with a built-in barcode scanner, and when the [Barcode Scanner] function is turned on, the built-in barcode scanner scans the test tubes of each sample. If the sample has a barcode label on the test tube and the barcode label is pasted correctly, the scanner will read the barcode code on the label, and the code will be displayed in the result.

3.6 Data input and output port

The analyzer has serial port, Ethernet interface, USB interface, PS/2 interface and other data input and output ports.

3.7 Calibration function

The user can use the URIT urine control materials and calibration test strips to calibrate the instrument.

3.8 Measurement items

Using with the sorted test strips, the analyzer can test 13 items in human urine, including ascorbic acid, leukocytes, ketone, nitrite, urobilinogen, bilirubin, protein, glucose, specific gravity, blood, pH, creatinine, Microalbumin, etc. The urine hydrometer (optional) can determine the specific gravity, color and turbidity of urine.

3.9 The report model

The analyzer has four units: symbol unit, international unit, traditional unit, and English unit. The report format has color and turbidity format.

3.10 Positive (abnormal value) prompt function

After the [Positive mark] function is turned on, the positive item (or abnormal value) in the measure result will be marked with *.

3.11 Automatic transmission of samples

The test tube rack sampling mechanism automatically transmits the samples to the sampling position.

3.12 Automatic sample aspiration, automatic dropping, automatic rinsing

The sample probe and injection pump will automatically take samples, and automatically drop samples at the dropping position. After dropping samples, the rinsing function will be automatically carried out and the waste liquid will be discharged.

3.13 Automatic collection of discarded test strips and waste liquid

The instrument automatically collects used test strips and waste liquid.

3.14 Automatic strips feeding

The strip selection system will automatically select the test strip in the test strip delivery slot and send it to the strip system. The strip of the dial system will send the test strip to the dropping position. After the sample is finished, the test strip is sent to the optical inspection system for measurement by the strip conveying system.

3.15 Function of emergency measurement

In the normal measurement, the emergency sample is placed in the emergency test tube rack, and it is pushed to the emergency position. After the instrument completes the normal measurement of the current sample, the emergency sample will be measured immediately. After the emergency measurement is completed, the system automatically resumes the interrupted normal measurement.

3.16 Function of identifying test tube rack No. automatically

The instrument adopts optical sensing device, which can automatically identify the number code on the right side of the test tube rack, which is convenient for customers to review. For he uncoded test tube rack, instrument will automatically number them from 101. We can know that the test tube rack is uncoded if its number is 101 or bigger than 101.

3.17 Consumable status real-time monitoring

The instrument can monitor the status of D21/D21N Detergent, D22 Detergent and waste liquid in real time, and promptly send out prompt information when the liquid state is abnormal.

3.18 Function of automatically enhancing the rinsing for high concentration samples

The analyzer can automatically enhance the rinsing of high turbidity samples detected by turbidimeter.

3.19 Failure alarm function

When the instrument has a fault, it can be alerted by the display and buzzer.

3.20 Mixing function

The instrument has a mixing function. When the [Mixing mode] is enabled, the sample can be mixed to effectively eliminate the adverse effects of liquid stratification caused by long-term placement of the sample, and the measuring result is more accurate.

3.21 Online function (optional)

The analyzer can be used for online measurement with automatic urine sediment analyzer.

3.22 Sample detection function

The instrument adopts liquid level sensing technology. When the [Sample detection] function is enabled, the sample probe samples. When the sample size is insufficient for analysis and measurement, the system will prompt the fault information.

3.23 Date editing

The system date can be edited and the system displays the new date after the modification is completed.

3.24 Chinese and English interfaces switching

You can choose the Chinese or English display interface.

3.25 Applicable test strips

URIT 11FA and URIT 12FA of URIT series.

Note: The types of applicable test strip have been set by the manufacturer before leaving the factory. If you need to change, please contact the after-sales service department.

3.26 Function of displaying test strip serial number

The instrument can correctly display the serial number of the to be measured strip.

3.27 Color recognition function (optional function)

The instrument has a color recognition function. When the instrument is equipped with an SG module and the [SG Module] function is enabled, the color recognition system will recognize the color of each sample. The identifiable colors are shown in Appendix 2.

3.28 Hydrometer measurement function (optional function)

The instrument has a hydrometer function. When the instrument is equipped with an SG module and the [SG Module] function is enabled, the urine specific gravity value of the sample can be measured. The detection range is 1.000 to 1.055, and the allowable bias range does not exceed ±0.002.

3.29 Turbidimeter measurement function (optional function)

The instrument has a turbidimeter function. When the instrument is equipped with an SG module and the [SG Module] function is enabled, the turbidity of the sample can be analyzed. The results of the turbidity analysis are shown in Appendix 2.

3.30 Function of ST module and YC module(optional)

There are connecting interfaces for ST module and YC module. Up to 20 tube racks can be placed. The ST module automatically rotates the samples 360° to read the bar code, and then records, displays and saves them. No requirement for barcode direction.

3.31 Closed sampling function

The sample can be collected in closed tubes(puncture sampling), without opening the cap manually.

3.32 Automatic measurement function

The analyzer has an automatic measurement function, and the analyzer can automatically measure the to be measured tube racks on the right platform of the tube injection mechanism under normal measurement conditions.

3.33 Function of prompting test strip no dropping

The analyzer has the function of prompting test strip without dropped sample, and the instrument detection system intelligently analyzes the sample status on the reagent pad. When the analysis finds that the reagent pad has no sample, it will mark or prompt in the result.

3.34 Measuring area temperature control function

The analyzer has the function of room temperature detection and temperature compensation in the detection area. In the room temperature of 16℃ to 30℃, the thermostatic module automatically adjusts the temperature of the measuring area, so that the results are consistent with those obtained at the optimum room temperature (25℃).

3.35 Real-time monitoring function of waste strips

The analyzer has the real-time monitoring function of waste strips. The waste box status is displayed on the left bottom of screen. If the waste box is full of waste strips, the prompt information will pop up.

3.36 Function of displaying strip images

The analyzer has the function of capturing, displaying and storing the images of urine test strips after sample addition, and is used for result review and inspection.

4. OPERATION

4.1 Cautions

Biohazard

Wear protective gloves to prevent infection.

Caution

Discard used gloves in accordance with local regulations.

Caution

Sample probe is sharp and it's running in the process of instrument operation. Do not approach it when not operating the instrument. Please use the correct method to operate the sample probe during instrument operation to avoid injury.

1. Please pay attention to prevent urine samples from sticking to or contacting with human body directly, so as to prevent from infection.

2. The instrument should not be exposed in excessive humidity and high temperature for a long time. It should be installed in a room of suitable size, preferably with an air conditioning unit whose temperature and humidity meet the technical requirements of the instrument. In order to ensure the accuracy of the measure results, please keep the temperature and humidity of the workshop consistent with the environmental conditions required by the urine strip.

Caution

If the instrument's working environment cannot meet the requirements of the used urine test strip, the accuracy of the measuring results cannot be guaranteed.

3. If abnormal conditions are found, please turn off the power immediately to avoid damage to the instrument and short circuit.

4. If the instrument malfunctions, please contact URIT. Do not attempt to repair the instrument by yourself. Any repair may damage the instrument.

5. Do not place the bottle containing liquid onto the instrument to avoid overturning, causing liquid to penetrate into the instrument.

6. Routine maintenance must be performed after one-day measurement to keep the instrument in the best condition.

4.1.1 Urine Sample

1) A urine sample can be stirred suitably before measurement, but can't be centrifuged.

2) Fresh urine samples should be collected as soon as possible with a clean and dry vessel. Place the urine samples under room temperature not exceeding one hour, otherwise, keep it in the refrigerator with temperature between 2℃ ~ 8℃ and analyze it within two hours.

3) DO NOT add any preservative, disinfectant or detergent to the samples.

4) The urine sample should avoid direct sunlight.

5) High concentration of ascorbic acid contained in urine sample may lead to the measuring results of NIT, BIL, GLU and BLD lower than the actual values or even false negative.

6) DO NOT measure hematuria as residue in it may cause incorrect results. The color tone of visually judged hematuria may not consist with the result with the instrument.

7) Urine after a drug may cause incorrect measuring results.

4.1.2 Strips

1) Use URIT test strips only. Using other strips other than the specified ones will result in instrument malfunction.

2) DO NOT use expired strips and/or strips if reagent pads show any signs of deformation, discoloration or deterioration.

3) Take out only as many strips as you need and close the cap immediately. If strips are exposed to the air for a long time, it may be deteriorated by moist or dust causing incorrect measure results.

4) DO NOT touch the reagent pads on the strip, lest the results are impacted.

5) Before analysis, make sure the strips you are using match with the strip type displayed on the instrument screen. Strip type setting method: Select [Setup menu] on the measurement interface, and click [Strip type] to switch to select the desired test strip type.

4.2 Preparations

4.2.1 Checking waste items

1) Used strips

Pull out the waste box and check if there are used strips in it. If there are, discard the strips.

2) Waste liquid bottle

Check if there is waste liquid in the bottle. If yes, empty the bottle.

4.2.2 Checking consumable items

1) Detergent (Product model: URIT D21/URIT D21N)

Make sure there is enough detergent in the detergent bottle. If not, replenish it with new detergent.

2) Thermal printing paper

Open the printer cover and check if there is printing paper loaded. If red lines on both sides of the printing paper show up, replace the paper.

3. Detergent (Product model: URIT D22)

Make sure there is enough detergent in the detergent bottle. If not, replenish it with new detergent.

4.2.3 Prepare test strips

1) Loading test strips

Prepare the test strips required for analysis.

Check if strips in the strip feeder are the same type as you need. If they are not, empty the feeder and load the correct strips.

A maximum of 500 test strips can be stored in the strip feeder. Only place the required number of

strips in it.

Caution

1. DO NOT touch the reagent pads on the strips.

2. Load the strips in correct direction.

3. Tighten the cap of strip canister to prevent strip from moisture.

4. Please do not put too many test strips at a time. Too many test strips will affect the measure speed of the instrument. It is best to place 100 test strips every time.

5. After completing the one-day measurement, put the remaining test strips in the test strip feeder back into the test strip canister and tighten the cap to prevent from getting wet.

2) Placing desiccant

Take out the desiccants from the strip canister and install them to the desiccant boxes in the strip feeder. See Figure 4-1.

Close the cap of the strip feeder and lock it.

Caution

1. The desiccant in the desiccant box should be replaced once a day.

2. When the ambient humidity is greater than 80%, you should check whether the desiccant is invalid before loading test strips. If the desiccant lost efficacy, replace it timely.

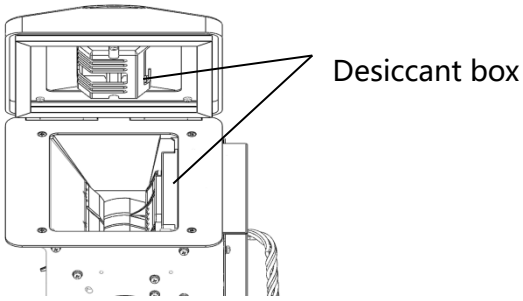


Figure 4-1

4.2.4 Preparing samples

1. Prepare sample tubes

Prepare clean sample tubes.

2. Fill samples

Fill sample tubes with at least 2 ml urine sample. Correct measure results may not be obtained if the sample is insufficient.

3. Place sample tubes

Place the tubes to test tube rack, ten tubes at most for a rack. Tubes with sealing film can be used. The instrument has a puncture function, so that sample can be collected without removing the cap.

If the barcode is to be scanned by the scanner built in the instrument, the barcode should be pasted as shewn below (as shown in Figure 4-2). The first diagram is for the instrument without ST module, and the second is for the instrument equipped with ST module.

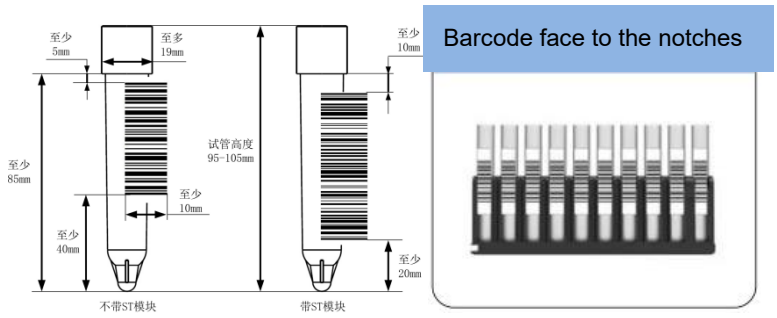


Figure 4-2

Caution

1. Insert the sample tubes straight in the bottom rubber cushions correctly. Otherwise, it will cause mechanical fault.

2. The barcode label should be placed facing to instrument for correct reading.

4. Place test tube rack

1) The test rack shall be placed on the platform on the right side of the injection mechanism, and the bottom notch on the right side of the test tube rack (see Figure 4-3) shall be inserted into the anti-reverse plate on the right side of the injection mechanism. The test tube rack should be placed from the outside to inside of the sample injection mechanism (see Figure 4-3).

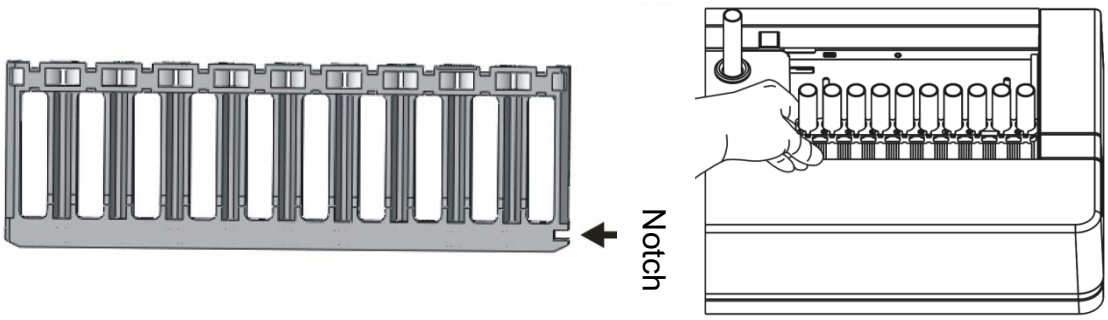


Figure 4-3

Caution

1. **Please place the test tube rack correctly, otherwise the instrument may be damaged because of test tube rack dumping or sample probe bumping.**
2. **If the urine sample overflows, wipe it clean before measuring, otherwise the urine may crystallize and affect the movement of the test tube rack.**

2) The test tube rack sample injection mechanism has a maximum of 6 to be measured tube racks on the right platform. If the instrument is equipped with ST module and YC module, the excess to be measured tube rack can be placed on it (Up to 20 to be measured racks). When you place the test tube rack, insert the notch on the right side of the rack into the anti-reverse tank on the right side of ST module.

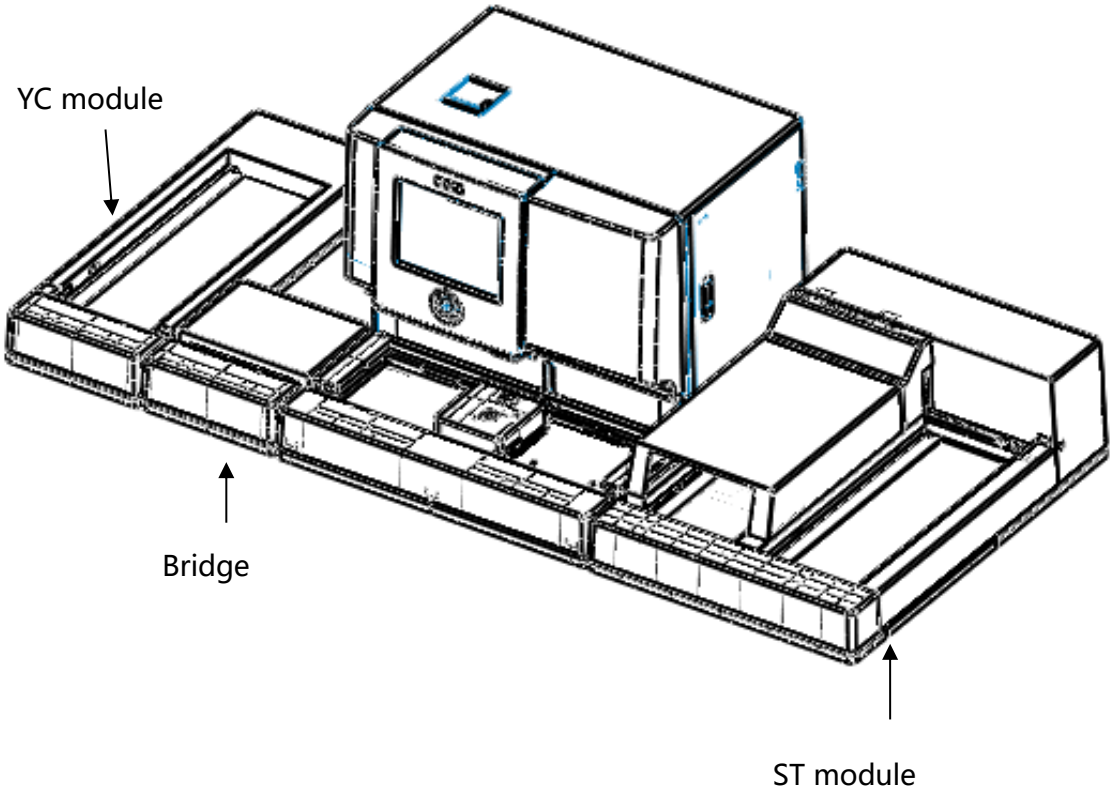


Figure 4-4

4.3 Settings

4.3.1 Turning on/off the instrument

- Turn on

Turn on the instrument and press the START button on the front. The instrument starts, the system is initialized, and each module performs a self-check.

- Turn off

In the measurement interface, select [Shut down] → [OK], the instrument will automatically perform fluid system maintenance. After the maintenance is completed, the instrument will be turned off automatically.

Caution

Please turn off the instrument in accordance with the normal shutdown process, so as to ensure that the software of the instrument system will not be abnormal, and make the instrument complete the maintenance of the fluid system, so as to ensure the service life of the fluid system.

4.3.2 Initial Interface

After booting, enter the initialization interface to start each module to perform self-check; if the self-check does not pass, the interface will display the faulty module and prompt corresponding fault information.

4.3.3 Measuring screen （Figure 4-5）

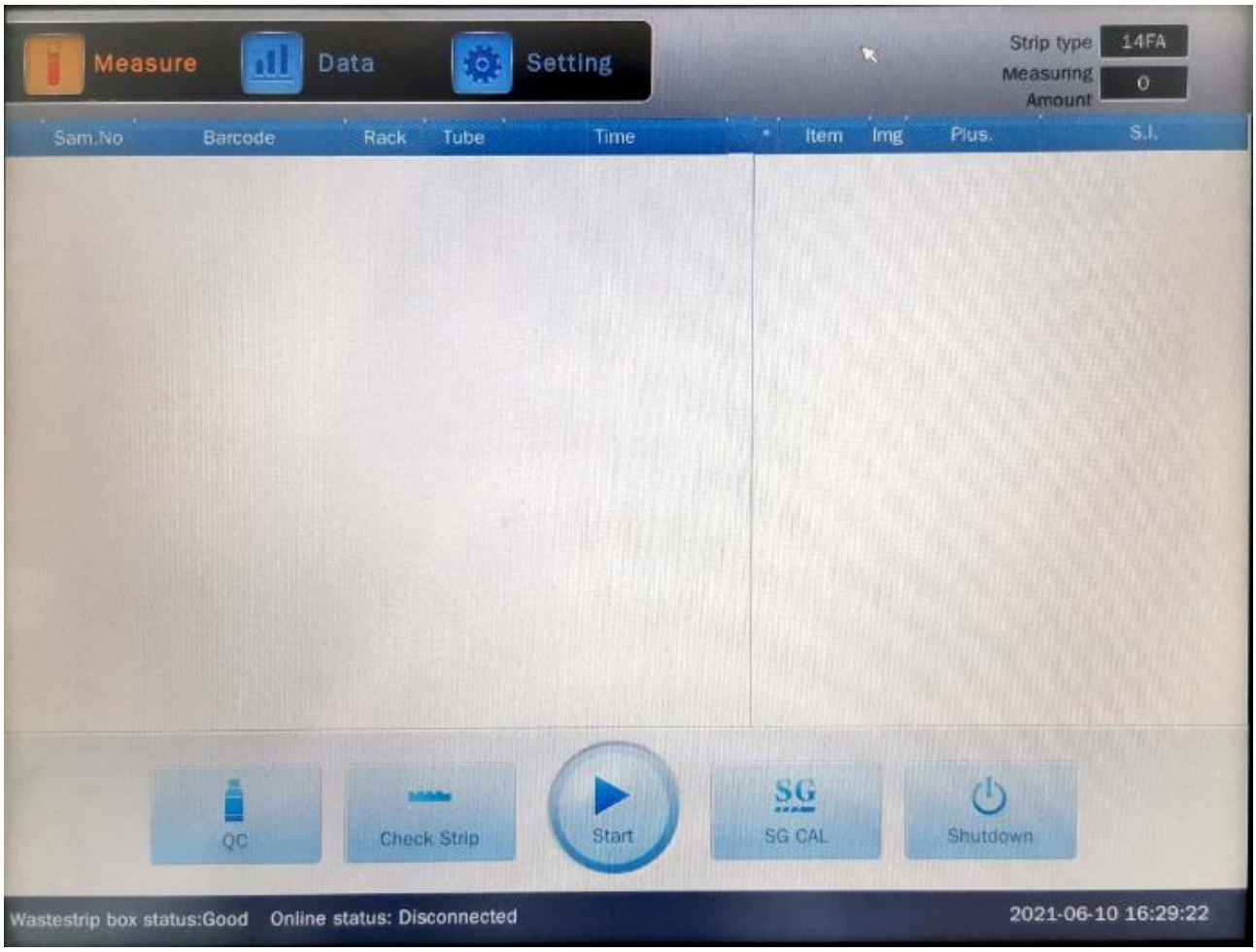


Figure 4-5

The measure interface function is for monitoring the analysis process and displaying analytical data in real-time.

The Measuring screen (shown as Figure 4-5) is composed of four sections:

1) Top bar: The dark background on the left is the three system interface buttons of [Measure], [Data], [Setting], the right is current test strip type and amount of to be measured samples.

1.[Measure]: Click this button system to enter measure interface.

2.[Data]: Click this button to enter data interface (see section 4.3.4 for details). In this interface, user can query, modify, delete, print the data and output them to the host.

3.[Setting]: Click this button to enter setting interface (see section 4.3.5 for details). In this interface, user can set system functions and parameters.

2) Middle column: The left part shows sample number, barcode number, test tube rack number, test tube number and measuring time of the to be measured sample, and the right part shows the results.

Caution

- **When the instrument does not have the optional automatic identification of the test tube**

rack or the uncoded test tube rack is used, the number displayed by the instrument is automatically numbered from 101.

- **The sample data of the emergency measurement shows that there is no test tube rack number and no test tube number. The serial number starts with st and defaults from st0001.**

3) Lower button bar: There are five function buttons such as 【QC】,【Parity】,【Start】,【SG Cal】,【Shutdown】.

1.[QC]: This button is used for the measurement of quality control products. Please read the instruction manual of the quality control carefully before using this function, and set the quality control parameters in advance. For details, see section 4.3.5.4.

Caution

Please read the operation manual of the quality control carefully before using the quality control function and set the quality control parameters.

2.[Parity]: This button is used to check the test strip. The instrument should always check the instrument with the supplied check strip. There are two check strips, one for daily use and the other for standby. After using the check strip for measuring, compare the results with the check value on the check bottle. If it matches, the instrument is normal, indicating that it can be used. If it does not match, another test strip can be used to test again. If it still does not match, you need to find the cause of the fault and use it after troubleshooting.

Caution

1. The test strip is only used for daily calibration.

2. Do not immerse the test strip in any liquid.

3. Take care to keep the test strip clean.

4. In general, only one is used and the other is used as a backup.

5. After detecting, please compare it with the data on the bottle. If it is consistent, the instrument can be used normally. If it does not match, please check the instrument carefully or verify that the test strip is faulty.

6. The data on the bottle can only be used as a basis for judging whether the instrument is in good condition, not as a reference for clinical diagnosis.

It is recommended to do the quality control measurement under the following conditions:

- When replace a new urine test strip
- When replace the instrument operator
- When there is any doubt about the results

3.[Start]: Click this button to pop up a dialog box for entering the initial sample number. After entering the initial sample number, click [OK] button in the lower right corner to enter measure interface, and the instrument starts to measure. After starting measuring, the button will switch to the [Stop] button, and clicking this button will stop the measurement.

Caution

Strip type must be set to be the same as you use before measuring.

4.[SG Cal]: This button is used for calibrating the function of color, specific gravity and turbidity modules. Before using this function, you should confirm that the SG module function status in setting interface is "On". After selecting [SG Calibration], a prompt box will appear. Please operate according to the information in the prompt box, and correctly place the color, specific gravity and turbidity calibration solution on the test tube rack so that the instrument can accurately calibrate the module.

Note 1: The color calibration solution is deionized water.

Note 2: The urine hydrometer/turbidity meter/color module is referred to as the SG module in the following.

4) Bottom status bar: display current system time, waste box status, etc.

4.3.4 Data interface

After the measurement is completed, the data can be printed out by the printer or output through external interface and stored in the storage of the instrument automatically for future use. In data interface, users can query, print, and output historical data to an online host.

Select [Data] in the measurement interface to enter data interface (see Figure 4-6).

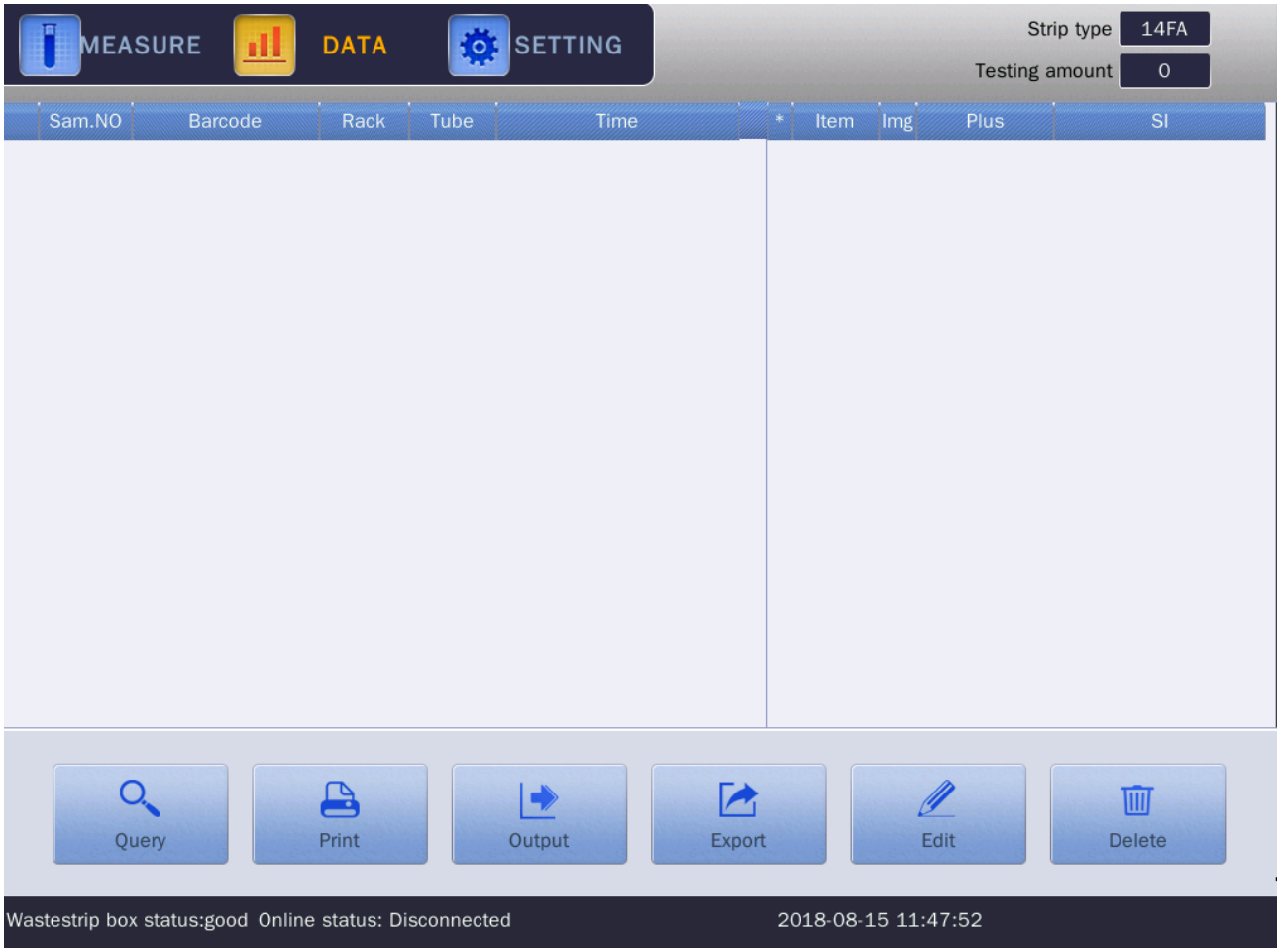


Figure 4-6

Data interface layout is similar to the measure interface. The main difference is the lower button bar. There are six function buttons such as [Query], [Print], [Output], [Export], [Edit], and [Delete].

1.[Query]: You can query according to the date or barcode. After pressing this button, the system will pop up the selection window. After setting the query conditions, click the [OK] button and the system will display the data that meets the query conditions.

2.[Print]: Print the currently selected record. Select multiple records to print continuously at a time.

3.[Output]: The selected data is output to the online host through the external port.

4.[Export]: Export the selected data to a USB flash drive. This function can only be performed after the instrument recognizes the USB flash drive.

5.[Edit]: Edit the selected data and edit the sample number, ID, etc.

6.[Delete]: Delete the selected records.

4.3.5 Setting interface

In the measure interface, select [Setting] to enter setting interface. The left part of interface is function buttons. Click the right part of the function setting buttons interface to display the corresponding function setting interface.

There are nine function setting buttons, which are: [General], [Transmission], [Sensitivity], [QC], [Customize], [Print], [Upgrade], [Debug], [About].

4.3.5.1 [General]

The [General] setting interface consists of six parts: [Measure], [Display], [Time], [Network], [Temperature] and [Fluid system]. User can switch the interface by selecting the corresponding interface label button.

1) [Measure]

1.[Strip type]: switch to display the type of applicable urine strip, and the operator can select the corresponding strip type according to the use requirements.

Caution

1. The type of test strip must be set before measurement. Confirm that the type of strip set by the instrument is the same as operator uses.

2. The type of test strip that can be selected has been set by the manufacturer before leaving factory. If you need to change it, please contact URIT.

2.[Sampling Mode]: The sampling mode of the instrument can be set to [Default Mode], [High Speed Mode], [Mixed Mode]. When [Default Mode] is selected, the instrument will turn off high speed mode and mix function. When [High Speed Mode] is selected, the instrument turns off mixing function and increases the measure speed. When [Mix Mode] is selected, the instrument turns on mixing function.

3.[Enhance rinse]: After this function is turned on, the instrument will automatically strengthen the cleaning of high turbidity samples to avoid cross-contamination.

Note: When this function is turned on, the instrument's measurement speed will decrease.

Caution

When the rinsing function is enabled, the daily usage of the detergent creases, resulting in

an increase of the detergent consumption.

4.[Sample detection]: After this function is turned on, the system will prompt the test tube rack number and test tube number that are insufficient in the sample volume.

5.[SG Module]: Turn on this function to enable the instrument to activate the urine hydrometer/turbidity meter/color module measurement function. This function is only available for instruments with a pycnometer/turbidimeter/color module.

6.[Barcode Scanner]: When this function is enabled, the instrument will automatically scan the barcode on the test tube through the built-in barcode scanner. This function is only available for instruments with a built-in barcode scanner.

7.[Test tube rack scanner]: When this function is enabled, the instrument will automatically scan the test tube rack code through the test tube rack scanner.

8.[Online]: When this function is enabled, the instrument starts the online working mode and can work online with the automatic urine sediment analyzer.

2) [Display]

1.[System Language]: The display language of the system interface can be set to Chinese or English.

2.[Data view]: It used to set the results of each item in the display interface, currently there are 7 display views, respectively:(1) Plus. (2) S.I. (3) Conv. (4) Eng. (5) Plus.+ S.I. (6) Plus.+ Conv.(7) Plus.+ Eng.

3.[Positive prompt]: When this function is enabled, the system will mark the positive or abnormal items in the measure results with "*".

4.[Continuous sample No.]: select the "on", and the instrument will add up the sample number according to the number of samples measured. Selecting the "off" instrument will calculate the sample number based on the location of the sample on the test tube rack.

5.[Color switch]: turn on or off color detection, printing and transmission.

6.[Emergency sign]: You can set the emergency sample serial number prefix mark. The instrument uses "st" as default.

7.[Screen brightness]: Drag the slider to adjust the brightness of the screen.

3) [Time]

In this interface, you can set the date and time of the current system.

The operation method is to select the date parameter to be modified, and click [+] or [-] to modify the corresponding parameter.

Click [Apply] to save the settings.

Click [Switch] to set the display mode of the date. For example, YYYY-MM-DD means that the date display mode is year, month and day, and MM-DD-YYYY means that the date display mode is month and day.

4) [Network]

In this interface, you can set the local network parameters such as "IP addr.", "subnet mask", and "Gateway".

Click [Apply] to save the settings.

5) [Temperature]

In this interface, you can set the target temperature of the thermostat control module and whether the temperature control module is enabled.

The operation method is to click the button on the right side of [Temperature control target temperature], and input the target temperature in the pop-up input box.

Click the button to the right of [Constant Temperature Control] to turn on or off the thermostat control module.

6) [Fluid system]

In this interface, you can operate fluid system maintenance such as empty fluid system.

The operation method is to click the button of [Empty fluid system] until no waste liquid is drained out.

4.3.5.2 [Transmission]

[Transmission]. The setup interface consists of two parts: [Transmission Parameters] and [Output Format]. The user can switch the interface by selecting the corresponding interface label button.

1) [Transmission params]

1.[Transmission format]: select the type format for the instrument to transmit data. If set as [U1600], the system will output the data in the transmission format of urit-1600 automatic urine analyzer (special transmission format can be added according to customer needs).

2.[Serial port output]: Turns on or off the serial output function of the instrument.After this function is enabled, the serial port parameters such as [Baud Rate], Parity Bits], [Data Bits], [Flow Control], [Stop Bits] can be set.

3.[Network output]: turn on or off the network output function of the instrument. After enabling this function, you can set parameters such as [Destination IP addr.], [Destination port], [Destination FTP port], [destination FTP user], [destination FTP passwd].

2) [Output format]

1.[Transmission mode]: You can select two transmission modes, default and custom.

2.[ID]: After turning on this function, you can select two ID formats: a, barcode; b, test tube rack and test tube number.

3.[Strip item]: Users can set measuring items as needed.

4.[Output template]: Users can set the order and location of measure items as needed.

4.3.5.3 [Sensitivity]

1.[Increase]: Increase the value of the cursor position.

2.[Decrease]: Decrease the value of the cursor position.

3.[Reset]: Restore the factory settings and generally use this setting.

4.[Save]: Save the current settings.

The sensitivity of the instrument can be set at this interface. The positive rate is only adjusted

between negative and positive. Adjust the linearity rate is to adjust the whole linearity by the button of Increase and Decrease. The item can be adjusted from 10 to -10.

Note: Each item can only adjust one of the "positive rate" or "linear rate" compensation. 0 means no adjustment.

Caution

When using the sensitivity adjustment function, it is recommended to use this function when accumulating sufficient QC data. At the same time, the clinical test compliance should be checked after adjustment.

4.3.5.4 [QC]

[QC]. The interface consists of seven parts: [UQ1], [UQ2], [UQ3], [QC4], [QC5], [SG QC], [Report]. The user can switch the interface by selecting the corresponding interface label button.

1) [UQ1]

[UQ1] there are three lists on the left side of the interface: the project and its corresponding target value upper and lower limits, and the right side is the QC batch number, name and its operation buttons.

1.[Lot No.]: you can enter the batch number of the quality control product.

2.[Name]: you can enter the name of the control item.

3.[Increase] [Decrease]: after selecting the upper or lower target value of the item to be adjusted, select the [Increase] or [Decrease] button to modify its target value.

4.[Rest]: restore the default target value of the instrument.

5.[Save]: save the current settings.

Note: The five interface contents and operations of [UQ1], [UQ2], [QC3], [QC4], [QC5] are the same, so the description is not repeated.

2) [SG QC]

1.[SG QC solution Lot]: you can input the batch number of SG module urine gravimeter quality control liquid.

2.[Turbidity QC solution Lot]: the batch number of turbidity quality control liquid of SG module can be input.

3.[Color QC solution Lot]: the batch number of SG module color quality control liquid can be input.

3) [Report]

[Report]: the interface is divided into three parts:

The left column shows the type, name, batch number, date and time of the quality control.

The right column shows the results of the quality control.

The bottom bar is the operation button:

1.[Query]: after pressing this button, the system will pop up the selection window. After setting the query conditions, click [OK] button and the system will display the data that meets the query conditions.

2.[Print]: print the current selected record, and select multiple records to print continuously at a time.

3.[Delete]: delete the selected record.

4.3.5.5 [Customize]

(1) Prepare before testing according to Section 4.2.

(2) Click 【Customize】 in Measure interface，and a new window pops up. Set the test information in the new window and select [OK] to start the custom test.

Caution

1. The same sample can be tested repeatedly several times in custom test. The test results can help to know the performance and accuracy of the instrument
2. Make sure the sample volume is sufficient when the same sample is tested repeatedly several times, otherwise the instrument may alarms.

4.3.5.6 [Print]

[Print]. it consists of three parts: [Parameters], [Built-in printer] and [External printer]. The user can switch the interface by selecting the corresponding interface label button.

1) [Parameters]

1.[Type of printer]: the instrument can be set to print results using built-in or external printers.

2.[Auto print]: when this function is enabled, the instrument will automatically print the results every time when a sample is measured.

3.[Printing language]: the printing language can be set to Chinese or English.

4.[Printing view]: this function is used to control the units of each item in the print result. There are currently 7 kinds of print views, which are: ⑴ Plus. + S.I. ⑵ Plus. + Conv. ⑶ Plus. + ENG. ⑷ Plus. ⑸ S.I. ⑹ Conv. ⑺ ENG.

2) [Built-in printer]

1.[Baud rate]: The baud rate parameter of the instrument and the built-in printer can be set.

2.[Parity bits]: The parity bit parameters of the instrument and the built-in printer can be set.

3.[Data bits]: Set The data bit parameters of the instrument and the built-in printer.

4.[Flow Control]: The flow control parameters of the instrument and the built-in printer can be set.

5.[Stop Bits]: The stop bit parameters of the instrument and the built-in printer can be set.

3) [External printer]

[Printer driver]： Select the driver for the external printer, and each corresponding printer driver will display the corresponding applicable printer model. Please confirm that there is an external printer model in the selected printer driver to ensure that the external printer works properly.

4.3.5.7[Upgrade]

This interface is mainly used to upgrade the system software. After inserting the configured U disk, click this button to upgrade the system software.

Caution

This function must be performed under the direction of URIT or a qualified engineer authorized by URIT.

4.3.5.8 [Debug]

The interface is used to debug equipment for the manufacturer.

4.3.5.9 [About]

This interface mainly displays the related information of each module of the instrument system.

4.4 Normal measurement

Biohazard

Wear protective gloves to prevent infection.

Caution

1、Dispose of used gloves in accordance with local laws and regulations.

2、By sampling through sample probe, the device is not allowed to be close to the sampling position during the measuring process, so as to avoid damage caused by sampling on people or the instrument.

1. Follow the instructions in section 4.2 to prepare for measurement.

2. Click the [Start] button on the measure interface and a new window will pop up. Set the measurement information in the new window and select [OK]. The instrument will start normal measurement. Click the [Stop] button to stop the instrument.

Caution

1、If the urinometer/turbimeter/color module is selected and the function is turned on correctly in the instrument setting, corresponding results will appear after the measurement.

2、If the result of turbidity is severe turbidity, it will affect the result of color and gravimeter. At this time, the result of color and gravimeter is only for reference.

3、If the instrument is installed online and the software is set up correctly, the instrument will be online automatically.

3. After completing the one-day measurement, clean the used waste strips and waste bottles from the waste container. Put the remaining test strips in the test strip delivery slot back into the test strip canister and tighten cap to prevent from being deteriorated due to moisture.

Biohazard

Discard waste liquid and waste test strips in accordance with local laws and regulations.

4.5 Emergency measurement

In the process of normal measurement, if emergency measurement is to be inserted, the following steps shall be followed:

1. Inject the emergency sample into a clean test tube with a sample volume of not less than 2 mL.
2. Put the prepared test tube into the emergency test tube.
3. Press the emergency button in front of the emergency test tube.
4. The instrument automatically performs emergency measurement. In the measure interface, samples with no test tube rack number, no test tube number, or sequence number beginning with “st” are emergency sample data.

Caution

When the emergency measurement is not completed, do not take the sample from the emergency test tube position to avoid damage to the person or instrument.

4.6 QC measurement and calibration

4.6.1 Check strip measurement

1. Take out the test strips from the selection mechanism, then put it into test strip canister and tighten the cap.
2. Clean up the used test strips in waste box, then place a clean paper towel.
3. Select the "Check strip" in the measure interface, and according to the operation manual shown on the instrument, put the test strip into the selection mechanism according to the direction marked by the test strip on the selection mechanism, and select the "confirm" to start.
4. The results of the test strip are compared with the marked values on the check bottle. If the results are consistent, the instrument will work normally.
5. Take out the test strip from the waste box and put it back into the test strip canister.

Users should always check the instrument with the supplied check strip. There are two check strips, one for daily use and the other for standby. After using the check strip for measuring, compare the result with the check value on the check bottle. If it consistent, the instrument is normal, indicating that it can be used. If it does not match, another test strip can be used to test again. If it still does not match, you need to find the cause of the fault and use it after troubleshooting.

Caution

1、The test strip is only used for daily calibration.

2、Do not immerse the test strip in any liquid.

3、Keep the test strip clean.

4、In general, only one is used and the other is used as a backup.

5、After the instrument is checked, please compare it with the data on the bottle. If it is in compliance, the instrument can be used normally. If it does not match, please check the instrument carefully or verify that the test strip is faulty.

6、The data on the bottle can only be used as a basis for judging whether the instrument is in good condition, but not as a reference for clinical diagnosis.

4.6.2 QC measurement

4.6.2.1 Measurement for urine test strip quality control materials

 **Caution**

In order to ensure the accuracy of the results, it is recommended to use the UIRT urine test strip quality control materials for quality control measurement in the following cases.

- **When start measuring every day**
- **When replace a new urine test strip**
- **When replace the instrument operator**
- **When there is any doubt about the results**

1. Prepare for the measurement as required in sections 4.2.1 ~ 4.2.3.

2. Set the quality control parameters according to the target value of the urine test strip quality control manual. For the specific operation, see section 4.3.5.4 for setting the target value of the instrument.

3. Prepare the quality control liquid according to the instructions on the urine test strip control manual. Inject the control liquid into a clean test tube, place the test tube containing the control liquid into the test tube rack according to the quality control order set by the instrument, and place the test tube rack on the right platform of the test tube rack sample injection mechanism.

4. In the measure interface, select [QC] → [Urinalysis QC], and confirm the order of the control solution placement according to the information prompted by the instrument. Click [Next], input the sample number information and select [Start] to start measurement.

5. After the measurement is over, the instrument will print the results and quality control statistics.

 **Caution**

1. **Please confirm the quality control measurement using the URIT brand urine test strip control, otherwise the quality control measurement will fail.**

2. **Please make sure that the quality control parameters set on the instrument are the same as those in the quality control specification, otherwise the wrong results will appear when the**

instrument statistics the quality control results.

4.6.2.2 SG module quality control measurement

Caution

In order to ensure the accuracy of the measure results, it is recommended to do QC measurement with URIT specific gravity, turbidity and color quality control materials in the following situations.

- **Calibrate once a month**
- **When there is any doubt about the results**

1. Ensure that the instrument has sufficient detergent.

2. Prepare the control solution according to the instructions on the specific gravity, turbidity, and color control solution instructions.

3. Select [QC] - [SG module QC] in the measure interface, and the system displays the prompt information.

4. According to the prompt information, the specific gravity, pore turbidity and color quality control solution into the clean test tube and place them on the corresponding test tube rack. The test tube cack is placed on the right platform of the test tube rack sample injection mechanism.

5. Click [Next], enter the sample number information and select [Start], the instrument will start the quality control measurement. After the measurement is finished, the instrument will display the quality control result and the quality control statistics result.

Caution

1. If the quality control result does not meet the reference value requirements in the quality control solution specification, the SG module calibration operation is required.

2. After the successful calibration, the quality control measurement will be carried out again. If the quality control results meet the requirements, the instrument will be normal. If the quality control fails, please contact our after-sales service department.

4.6.3 SG module calibration measurement

1. Ensure that the instrument has sufficient detergent.

2. Select [SG Calibration] on the measure interface, and the system displays the prompt message.

3. According to the prompt information, pour the specific gravity, turbidity and color calibration solution into the clean test tube and place them on the corresponding test tube rack. The test tube rack is placed on the right platform of the test tube rack sample injection mechanism.

4. Select [Start], and the instrument will start the calibration operation. If the calibration is passed, the "calibration success" will be displayed. If the calibration is not passed, the "calibration fail" will be indicated.

 **Caution**

1. Please make sure that you use URIT calibration products, otherwise the calibration will fail.

2. The color calibration solution is deionized water.

3. If the calibration fails twice, please contact our after-sales service department.

4. If the instrument is not equipped with a hydrometer, turbidity meter, color module, it is not necessary to perform quality control measurement and calibration for specific gravity, turbidity and color.

 **Caution**

In order to ensure the accuracy of the measure results, it is recommended to use the URIT specific gravity, turbidity and color calibration products for calibration measurement in the following cases.

- **Calibration once a month**
- **When there is any doubt about the results**

5. Maintenance

UC-1800 is a precise instrument. It's very important to keep maintenance periodically to keep the instrument work properly. If there's something wrong with the instrument, please send it to the maintenance department or repair it by the professionals which URIT appoints.

Precautions for Maintenance

1. Carefully read through the Operation Manual, as well as the reagent Instruction before maintenance.

2. Keep the instrument clean to guarantee the good performance.

3. Empty the fluid system and cover the instrument with cloth if it is disused for a long time, and perform Quality Control analysis when resuming the instrument.

4. DO NOT disassemble the instrument at will.

Biohazard

1. **Wear protective gloves to prevent bacterial infection.**
2. **Dispose waste liquid, used consumables, used gauze, used cotton swabs and used gloves according to local regulations.**

5.1Maintenance Items

Daily maintenance

Items	Suggested intervals
Clean the waste box	Every day
Discard waste liquid	Every day

Replacing consumables

Items	Suggested intervals
Replace Detergent D21/D21N	After 800 measurements
Replace Detergent D22	About 40 days
Replace thermal printer paper	After 200 measurements

Periodic maintenance

Items	Intervals
Clean sample dropping platform	weekly
Clean selection mechanism	weekly

Clean test tube rack injection platform	weekly
Clean ST module	weekly
Clean YC module	weekly

5.2 Daily Maintenance

5.2.1 Clean the waste box

After using the instrument every day, empty the used test strips in the waste box and disinfect the waste box.

Biohazard

Wear protective gloves to prevent bacterial infection.

Caution

Discard used test strips and used gloves according to local regulations.

Items required: Alcohol, cotton fabric, protective gloves.

Step 1: discard the used strips

1) Make sure the instrument is turned off or on standby.

2) Open the waste box, and discard used strips.

Step 2: Clean the waste box

1) Clean the waste box with alcohol, and then wash it with water.

2) Dry the waste box with cotton fabric.

Step 3: Install the waste box

Install the waste box.

5.2.2 Discard waste liquid

Discard waste liquid after one- day measurement.

Biohazard

Wear protective gloves to prevent bacterial infection.

Caution

Discard waste liquid and used gloves according to local regulations.

Items required: alcohol, protective gloves.

Step 1: Discard waste liquid

1) Make sure the instrument is turned off or on standby.
2) Remove the cap from the waste bottle.
3) Discard the waste liquid.

Step 2: Clean the waste bottle

Clean the waste bottle with alcohol, and wash it with water.

Step 3: Cap the waste bottle

Put the cap back on the waste bottle and tighten it.

5.3 Replace consumables

5.3.1 Replace the detergent

Please replenish detergent when it is insufficient.

Item required: Detergent.

Complete the following steps:

1. Read the instruction manual of the detergent carefully, pay attention to the corresponding operation items.

2. Make sure the instrument is turned off or on standby.

3. Remove the cap and the liquid tubes from the detergent bottle.

4. Install the cap and liquid tubes on a new detergent bottle.

5.3.2 Replace thermal printing paper

When red lines appear on both sides of the printing paper, replace it.

Items required: thermal printing paper, scissors.

Step 1: Cut off remaining paper

1) Make sure the instrument is turned off or on standby.
2) Grasp the railing to pull up, open the printer cover (Figure 5-1).
3) Take out the remaining paper (Figure 5-2).

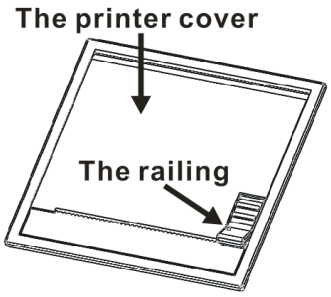


Figure 5-1

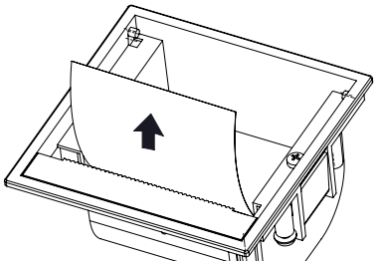


Figure 5-2

Figure 5-3

Step 2: Prepare a new roll of printer paper

Cut the end of a new paper roll straight across (Figure 5-3).

Step 3: Load the new paper roll

1. Place the paper roll in the printer bin slot (Figure 5-4).

2. Place the front end of the paper roll directly at the paper exit and cover the paper compartment cover (Figure 5-5).

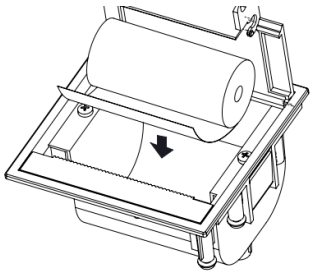


Figure 5-4

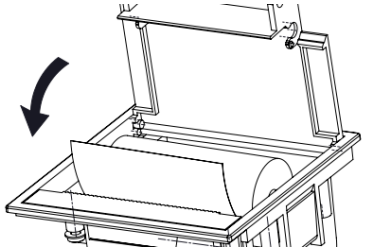


Figure 5-5

Caution

1. Print characters are only displayed on the front side of the paper roll, and if they are reversed, characters cannot be printed.

2. When the paper is used up, it will be added in time.

3. Before installing the paper, be sure to check if the paper is dry. If the paper is damp, replace it immediately to avoid paper jams. If the printer jams, please reinstall it.

5.4 Periodic Maintenance

5.4.1 Clean dropping platform

Items required: alcohol, soft fabric, protective gloves.

Biohazard

Wear protective gloves to prevent bacterial infection.

Caution

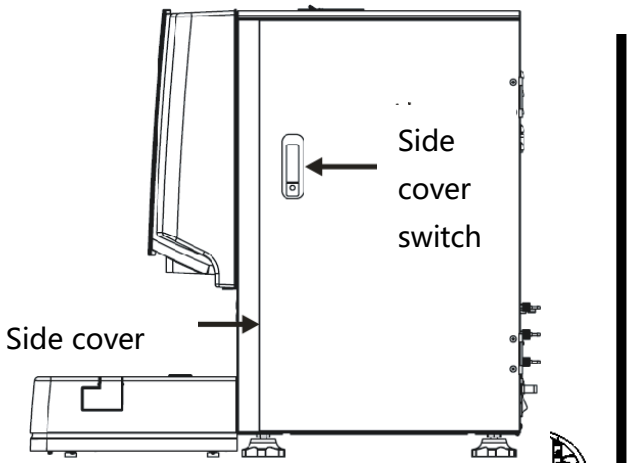
Discard used fabric and used gloves according to local regulations.

Step 1: Turn off the power supply

Make sure the instrument is on standby, and then exit the system and power off.

Step 2: Open the side cover

Use the side cover switch key to open the side cover (as shown in Figure 5-6).



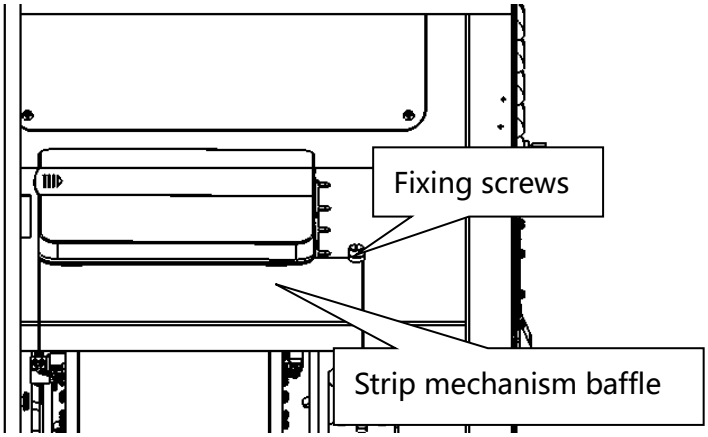
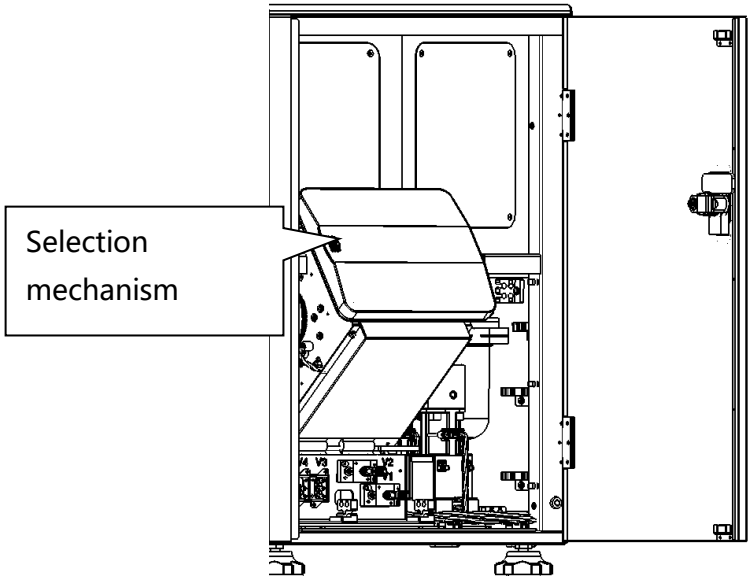


Figure 5-6 **Figure 5-7**

Step 3: Remove the selection mechanism baffle

1. Remove the fixing screws of the selection mechanism baffle and take out the baffle (as shown in Figure 5-7).

2. Reverse the selection mechanism to the right (as shown in Figure 5-8).



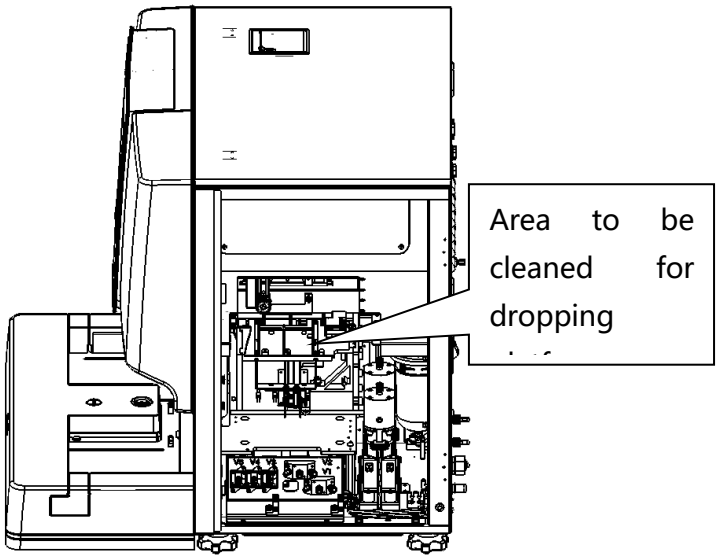


Figure 5-8 **Figure 5-9**

Step 4: Clean the dropping platform

Clean the dropping platform with alcohol. (Figure 5-9)

Caution

Do not scratch the dropping platform, otherwise it may affect the movement of the strip.

Step 5: Install the selection mechanism and the baffle

1. Put the selection mechanism back in place.

2. Replace the baffle and lock the fixing screws.

Step 6: Install the side cover

1. Replace the side cover.
2. Close the side cover switch and lock the side cover.

5.4.2 Cleaning the selection mechanism

Items required: big-size air pump, tissue paper.

Step 1: Turn off the power supply

Make sure the instrument is on standby, and then exit the system and power off.

Step 2: Remove test strips

1) Open the sealed cap (Figure 5-10).
2) Remove test strips from strip feeder (Figure 5-11).
3) Wrap them with tissue paper to prevent dust contamination.

Caution

Do not touch the reagent pads of strip for it may cause incorrect measure results.

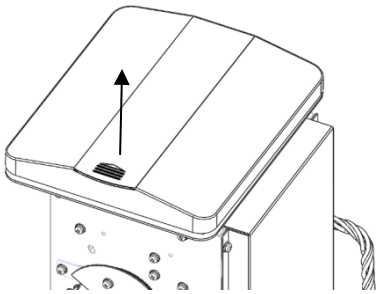


Figure 5-10

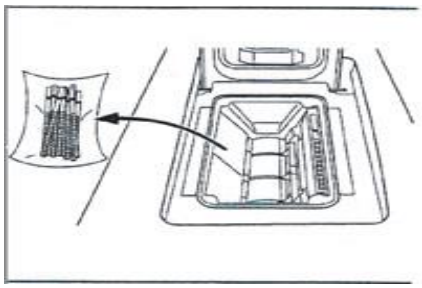


Figure 5-11

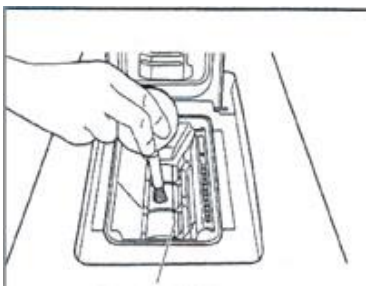


Figure 5-12

Step 3: Clean the test strip feeder

1) Using the air pump to clean the inside of the test strip feeder.(Figure 5-12).
2) Load test strips back in the strip feeder.
3) Install the feeder cover and lock it.

Step 4: Open side cover

Use the side cover switch key to open the side cover (as shown in Figure 5-6).

Step 5: Install the selection mechanism baffle (Figure 5-7).

1) Remove four screws in the corner of plate.
2) Remove the baffle.

Step 6: Clean the feeding components

1) Place the test strip feeder to the right (Figure 5-8).
2) Clean the areas with the pump (Figure 5-13).

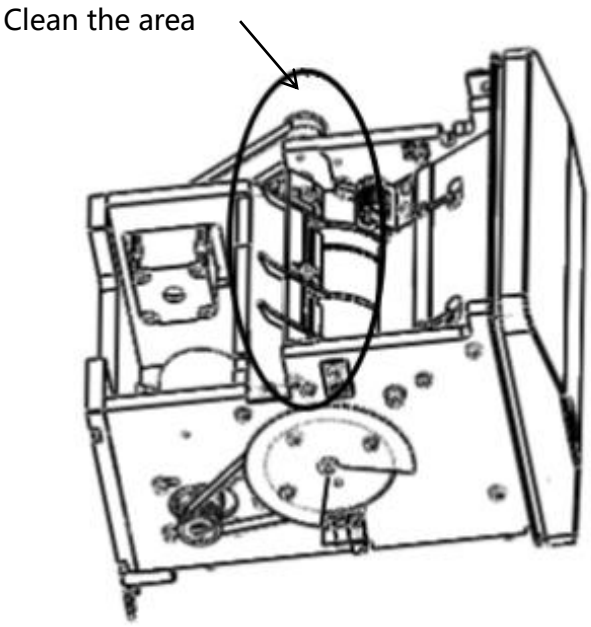


Figure 5-13

Step 7: Install the selection mechanism and baffle

1) Install the selection mechanism
2) Install the baffle, and tighten the screws.

Step 8: Install the side cover

1) Install the side cover.
2) Close side cover.

5.4.3 Clean test tube rack injection mechanism，ST module and YC module.

Items required: alcohol, gauze or cotton swab, cloth or paper towels, protective gloves.

Biohazard

Wear protective gloves to prevent bacterial infection.

Caution

Discard used cleaning materials according to local regulations.

Step 1: Turn off the power

Make sure the instrument is on standby, turn off the system and turn off the power.

Step 2: Empty the test tube racks on the platform

Empty the test tube rack on expansion mechanism ST module and YC module.

Step 3: Clean the surface of the platform

Use gauze or cotton swab to clean the test tube injection mechanism, ST module and platform of YC module. (Figure 5-14) , and clean the dirt on the platform.

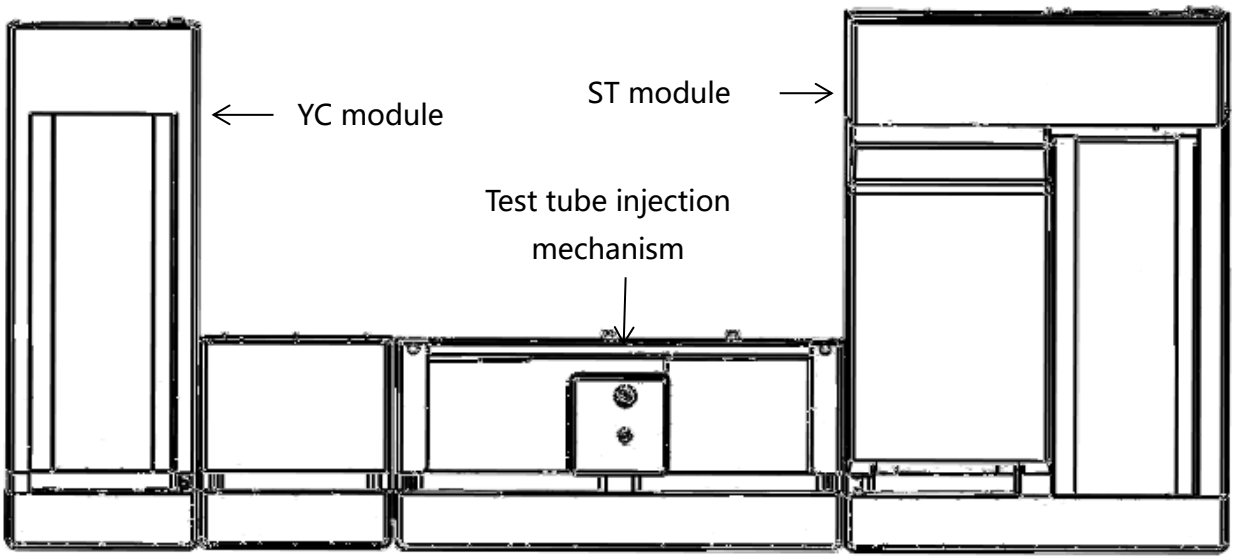


Figure 5-14

Step 4: Clean the induction optocoupler

Use gauze or cotton swab to clean the test tube rack injection mechanism, ST module and inductive optocoupler on ST module(as shown in Figure 5-14, where the circle position is the inductive optocoupler position). Clean the stain on the surface of the optocoupler .

5.5 Long-term Disuse Maintenance

Biohazard **Wear protective gloves to prevent bacteria infection.**
Caution **Discard used cleaning materials, waste liquid, exchanged components, and**

used gloves according to local regulations.

Items required: detergent, cotton swabs, deionized water, alcohol, paper towels, protective gloves.

Step 1: Clean the strip selection mechanism, the dropping detection platform, and the test tube rack sample injection mechanism.

Refer to Section 5.4

Step 2: Discard used test strips

Discard the used test strips in the waste box.

Step 3: Drain Fluid System

1) Make sure the instrument is on standby.

2) Pull out the tube from the detergent bottle.

3) Select [Setting] → [General]→ [Fluid system] on the instrument's measure interface, and click [Empty liquid system] until no liquid is discharged from the waste tube.

4) When the instrument is on standby, turn off the system and power.

Step 4: Discard detergent

Discard detergent from the detergent bottle.

Step 5: Discard waste liquid

Discard waste liquid from the waste bottle.

Step 6: Remove the power cord

Pull the power cord from the socket.

6. TROUBLESHOOTING

Caution

Make sure if it is necessary to turn off the power supply before troubleshooting.

Troubleshooting operations are described in this chapter. If the problem persists after following the recommended remedy, contact URIT.

6.1 Troubleshooting guide

Be sure to read through this operation manual and be familiar with the operation flow and maintenance.

In general, follow the three steps below to carry out troubleshooting:

Step 1: Locate malfunction

Operator should be able to confirm the malfunction cause. The malfunction can be cleared only when it's verified correctly.

Step 2: Class malfunction

Malfunctions could be classed into three types:

1) Malfunctions related to hardware. Contact URIT for service.

2) Malfunctions related to software. Contact URIT for service.

3) Malfunctions related to sample analysis. User can eliminate the malfunction under the instructions of engineer authorized by URIT.

Step 3: Eliminate malfunction

URIT engineers will take corrective measures to eliminate the malfunctions, or user can get it done with the help from engineers authorized by URIT.

6.2 Technical assistance

URIT is available to help you if instrument problem occurs. Please find the contact information in "Copyright and Declaration" before calling, and identify the following information:

1) The instrument model.

2) The instrument serial number.

3) Details of malfunction.

4) Data or report relative to the malfunction.

6.3 Troubleshooting chart

This troubleshooting chart lists various problems and possible causes and recommended remedies to quickly and easily correct the problem. If the problem persists after following the recommended remedy, contact URIT.

Troubleshooting Chart

SN	PROBLEM	POSSIBLE CAUSE	REMEDY

1	Power failure	Power supply is broken. Fuse is broken.	Check power supply and fuse. If the problem persists, contact URIT.
2	No detergent	Detergent is run out. Liquid level sensor is broken.	Replenish detergent. If the problem persists, contact URIT.
3	No printing	Printer paper is run out. Printer is broken or incorrect setting.	Replace a new paper roll. Check the printer or software setting. If the problem persists, contact URIT.
4	Display touch is not sensitive	Display touch point offset Display failure	Recalibrate the display. If the problem persists, contact URIT.
5	Black screen	Screen is broken or power failure. Fuse is broken.	Check power supply and fuse. If the problem persists, contact URIT.

Troubleshooting Code Chart

Error code	Error information	Brief treatment scheme
T-0004	Printer out of paper	Please install printing paper.
T-0101	A1 roller reset fault	Restart the machine. If the problem persists, contact URIT.
T-0102	A1 strip rotator reset fault	
T-0103	Jamming. Take out the jammed strips and click Continue.	Take out the jammed test strips and click OK to continue the test.
T-0104	No strips. Please add strips and click Continue	After putting the test strip into the selection mechanism, click on the interface to continue the measurement.
T-0131	Communication fault of A1	Restart the machine. If the fault is still unsolved, contact the after-sales service department of Guilin URIT MEDICAL ELECTRONIC CO., LTD.
T-0132	A1 operation timeout	
T-0201	A2 driving liver reset fault	
T-0202	Dropping sample position strips inverse	
T-0203	No strips in dropping position. Please take out the strips on dropping sample platform and click Continue.	Take out the test strips on dripping platform and click OK to continue the test.
T-0204	Strip type error	Reset the strip type and confirm that the strip type of the instrument is consistent with the

		strip type actually used.
T-0205	No strip is detected.	Restart the machine. If the fault is still unsolved, contact the after-sales service department of Guilin URIT MEDICAL ELECTRONIC CO., LTD..
T-0206	Temperature control module fault	Restart the machine. If the fault still cannot be solved, please close the corresponding mechanism module in the [Setting]-[Common] interface, or contact the after-sales service department of Guilin URIT MEDICAL ELECTRONIC CO., LTD..
T-0207	Temperature sensor error.	
T-0208	Waste strip is full.	After cleaning the waste strip, click to continue the measurement.
T-0209	File system of A2 format failed.	Restart the machine. If the fault is still unsolved, contact the after-sales service department of Guilin URIT MEDICAL ELECTRONIC CO., LTD..
T-020a	CIS is not calibrated	Please recalibrate CIS
T-020b	CIS calibration block not found	Please check the inspection head installation.
T-020c	CIS calibration file is saved incorrectly	
T-020d	CIS calibration file is failed to open	
T-020e	CIS cable connection failure	
T-020f	CIS light is weak	
T-0210	CIS light calibration failed	
T-0211	Strip movement time calibration failed	
T-0231	Communication fault of A2	Restart the machine. If the fault is still unsolved, contact the after-sales service department of Guilin URIT MEDICAL ELECTRONIC CO., LTD..
T-0232	A2 operation timeout	
T-0301	A3 X axis motor reset left fault	
T-0302	A3 X axis motor reset right fault	
T-0303	A3 Y axis motor reset up fault	
T-0304	Large injection pump motor reset fault	
T-0305	Small injection pump motor reset fault	
T-0306	No detergent D21. Please click 【OK】 after priming detergent.	After priming the detergent, click to continue the measurement.
T-0307	No detergent D22. Please click 【OK】 after priming detergent.	After priming the detergent, click continue the measurement.
T-0308	Waster liquid full. Please click 【OK】 after discharging waste liquid.	After cleaning the waste, click continue the measurement.
T-030b	Communication fault of SG module	Restart the machine. If the fault is still unsolved, contact the after-sales service department of

		Guilin URIT MEDICAL ELECTRONIC CO., LTD..
T-0331	Communication fault of A3	Restart the machine. If the fault is still unsolved, contact the after-sales service department of Guilin URIT MEDICAL ELECTRONIC CO., LTD..
T-0332	A3 operation timeout.	
T-0341	Adjusting brightness failed as it's calibrating color.	Recalibrate to confirm that the calibration operation meets the requirements of the instructions. If the fault is still unsolved, contact the after-sales service department of Guilin URIT MEDICAL ELECTRONIC CO., LTD..
T-0342	Reading data error as calibrate color.	
T-0343	Adjusting brightness error as it's calibrating proportion	
T-0344	Reading data error as it's calibrating proportion	
T-0345	Unreasonable high-low specific gravity calibration data. Grade failed.	
T-0346	Adjusting brightness failed as it's calibrating turbidity	
T-0347	Reading data failed as it's calibrating turbidity	
T-0348	Unreasonable high-low turbidity calibration data. Grade failed.	
T-0349	Color detection failed	Please recalibrate the CIS.
T-034a	Specific gravity detection failed	
T-034b	Turbidity detection failed	
T-0501	A5 right driving lever motor reset fault	Restart the machine. If the fault is still unsolved, contact the after-sales service department of Guilin URIT MEDICAL ELECTRONIC CO., LTD..
T-0502	A5 left driving lever motor reset fault	
T-0503	Horizontal sample injection motor reset fault	
T-0504	Online motor right photocoupler reset fault	
T-0505	Online motor left photocoupler reset fault	
T-0506	Left rack is full. Please click【OK】after moving away.	After removing the test tube rack on the left platform of the test tube rack injection mechanism, click the machine to continue the measurement.
T-0509	Communication error of barcode scanner	Restart the machine. If the fault still cannot be solved, please close the corresponding mechanism module in the [Setting]-[Common] interface, or contact the after-sales service department of Guilin URIT MEDICAL ELECTRONIC CO., LTD..
T-050a	Communication error of rack No. scanning module	
T-050b	401 optocoupler fault in right inner part of injection mechanism	Restart the machine. If the fault is still unsolved, contact the after-sales service department of

T-050c	401 optocoupler fault in the right outside of A5	Guilin URIT MEDICAL ELECTRONIC CO., LTD..
T-050d	401 optocoupler fault in the left inner of A5	
T-050e	401 optocoupler fault in the left outside of the A5	
T-050f	In bridge optocoupler error	
T-050g	In bridge timeout	
T-0531	Communication error of A5	
T-0532	A5 operation timeout.	
T-0a31	Communication fault of network	If you need to on-line use, please make sure the network cable is connected and then restart the instrument. If the fault still cannot be solved, please contact URIT after-sales service department.

When to call for assistance:

- If the problem continues after performing the steps described in troubleshooting chart.
- If the accessories are damaged when using.
- If additional assistance is required concerning an instrument problem.
- Components and accessories of the Instrument are broken apparently.

NOTE: Before replacing fuse, be sure to turn off the instrument and unplug the power cord.

Caution

If instrument is scrapped, please according to the regulation of waste electrical and electronic equipment recycling to deal with.

7. Transportation and storage

7.1 Transportation

This instrument is a precision measuring instrument. The necessary protective measures should be taken in the course of transportation. Keep away from toxicant, nocuous and corrosive material.

Transport condition: -20℃ ~ 55℃, RH≤95%.

Atmospheric pressure: 86kPa ~ 106kPa.

7.2 Storage

Wrapped instrument should be stored in a well-ventilated room with temperature of -20℃ ~ 55℃, relative humidity ≤95%, and keep away from toxicant, nocuous and corrosive materials.

Atmospheric pressure: 86kPa ~ 106kPa.

Appendix 1: Exchangeable Parts

SN	ITEM	REMARK
1	Fuse	T3.15AL250V
2	Sample probe	
3	Solenoid valve	
4	Injection pump	
5	Printer	
6	Display	
7	Switching power supply	
8	Fan	
9	Optical fiber	
10	Selection mechanism	
11	Injection mechanism	
12	Main board	
13	Control board	
14	SG module	
15	CIS module	

Caution

If you need to change the device, please contact the after-sales service department of URIT MEDICAL ELECTRONIC CO., LTD. Our company will arrange professional services at home.

Appendix 2：Turbidity/color recognition cross - reference table

No.	Description
1	Clear
2	Micro turbid
3	Turbid
4	Very turbid

Color	
No.	Description
1	Red
2	Yellow
3	Brown
4	Green
5	Colorless
6	Other

Appendix 3：Item name comparison table

SN	Abbreviation	Full name
1	VitC	Ascorbic acid
2	LEU	Leukocytes
3	KET	Ketone
4	NIT	Nitrite
5	URO	Urobilinogen
6	BIL	Bilirubin
7	PRO	Protein
8	GLU	Glucose
9	SG	Specific gravity
10	BLD	Blood
11	pH	pH
12	CR	Creatinine
13	MA	Microalbumin
14	Color	Color
15	Turbidity	Turbidity

Appendix 4：Unit results comparison table

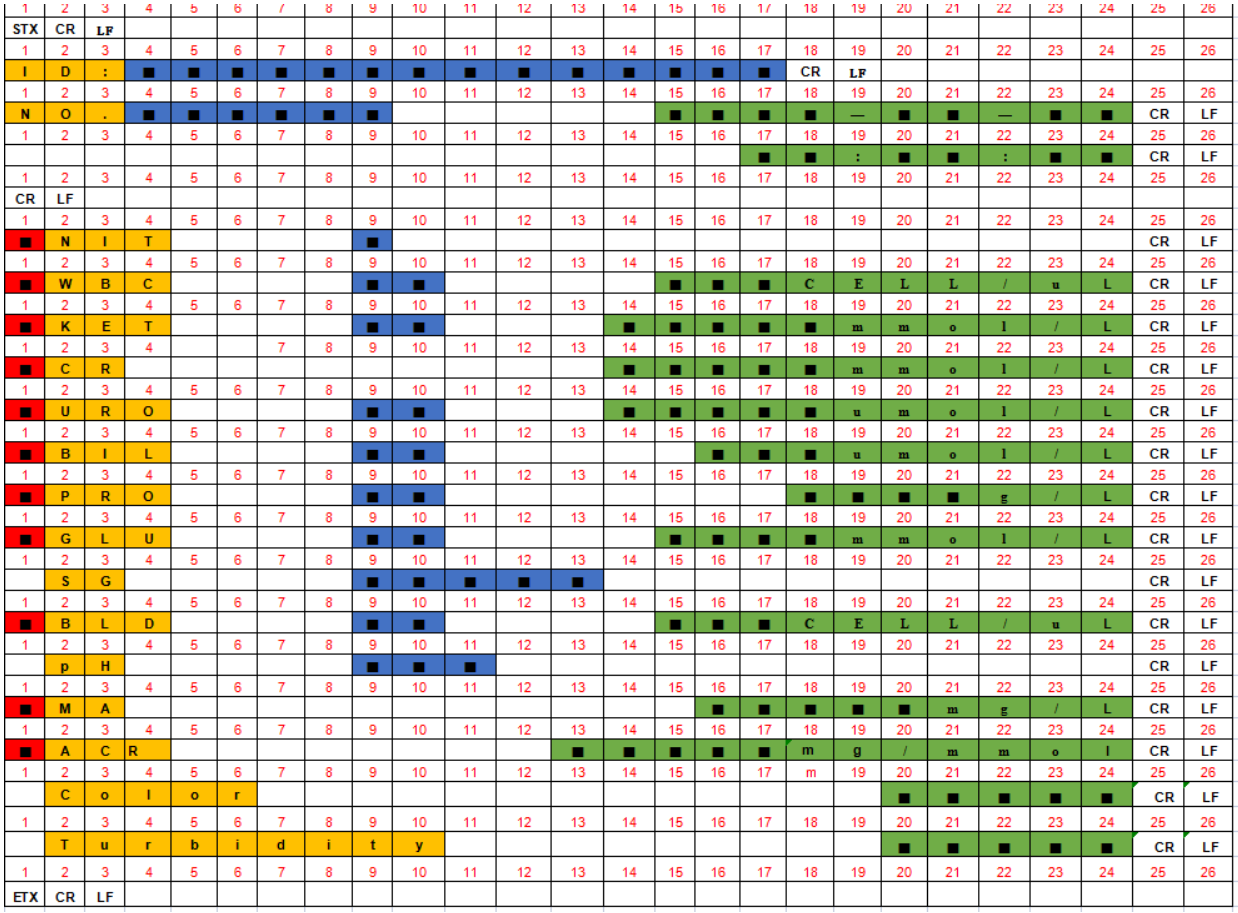
Measure items	Semi-quantitative symbol and related concentration value						
VitC	Semi-quantitative symbol	-	±	+1	+2	+3	
	international unit(mmol/L)	0	0.6	1.4	2.8	5.6	
	traditional unit (mg/dL)	0	10	25	50	100	
	English unit	Negative	Trace	Small	Middle	Large	
LEU	semi-quantitative symbol	-	±	+1	+2	+3	
	international unit(CELL/μL)	0	15	70	125	500	
	traditional unit (leu/μL)	0	15	70	125	500	
	English unit	Negative	Trace	Small	Middle	Large	
KET	semi-quantitative symbol	-	±	+1	+2	+3	
	international unit(mmol/L)	0	0.5	1.5	4.0	8.0	
	traditional unit (mg/dL)	0	5	15	40	80	
	English unit	Negative	Trace	Small	Middle	Large	
NIT	semi-quantitative symbol	-	+				
	international unit	Neg	Pos				
	traditional unit	Neg	Pos				
	English unit	Negative	Positive				
URO	semi-quantitative symbol	Normal		+1	+2	+3	
	international unit(μmol/L)	Normal		33	66	131	
	traditional unit (mg/dL)	Normal		2.0	4.0	8.0	
	English unit	Normal		Small	Middle	Large	
BIL	semi-quantitative symbol	-		+1	+2	+3	

	international unit(μmol/L)	0		8.6	33	100	
	traditional unit (mg/dL)	0		0.5	2.0	6.0	
	English unit	Negative		Small	Middle	Large	
PRO	semi-quantitative symbol	-	±	+1	+2	+3	
	international unit(g/L)	0	0.15	0.3	1.0	≥3.0	
	traditional unit (mg/dL)	0	15	30	100	300	
	English unit	Negative	Trace	Small	Middle	Large	
GLU	semi-quantitative symbol	-	±	+1	+2	+3	+4
	international unit(mmol/L)	0	2.8	5.5	14	28	≥55
	traditional unit (mg/dL)	0	50	100	250	500	≥1000
	English unit	Negative	Trace	Small	Middle	Large	Large
SG	semi-quantitative symbol	1.005	1.010	1.015	1.020	1.025	1.030
	international unit						
	traditional unit						
	English unit						
BLD	semi-quantitative symbol	-	±	+1	+2	+3	
	international unit(CELL/μL)	0	10	25	80	200	
	traditional unit (mg/dL)	0	0.03	0.075	0.24	0.6	
	English unit	Negative	Trace	Small	Middle	Large	
pH	semi-quantitative symbol	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0
	international unit									
	traditional unit									
	English unit									
CR	international unit(mmol/L)	0.9		4.4	8.8	17.6	26.4			
	traditional unit (mg/dL)	10		50	100	200	300			

MA	international unit(mg/L)	10	30	80	150		
	traditional unit (mg/dL)	1	3	8	15		

Appendix 5：Output Format of Data

12FA Output Format



NOTE:

1. The digital represent the serial port output ASCII code serial numbering.

2. A frame starts with STX (0x02) and ends with ETX (0x03); Each line within the frame ends with CR LF (0x0d 0x0a carriage return /line feed); Each line takes up to 26 characters and is initialized as a space character (0x30).

3. "■" represent measure results.

4. The data output format of other test strip types is consistent with 12FA's, just the item in a different order, and the item order is marked on the test strip canister.

5. The data transmitted by Ethernet is transmitted by using TCP packets. The data content of the transmission is consistent with the data content of the serial port. At the same time, each time a data is transmitted, the instrument will perform TCP connection, data transmission, and TCP disconnect operation, and the data receiving end does not need to send any data. You only need to listen to the corresponding TCP port to receive data. It is recommended that the data receiver use event-driven mode for data reception.

Appendix 6:Toxic and Hazardous Substances or Elements

Parts		Toxic and Hazardous Substances or Elements					
		Plumbum (Pb)	Mercury (Hg)	Cadmium (Cd)	Chromium VI(Cr(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers(PBDE)
Host	Shell	○	○	○	○	○	○
	Printed circuit board Assembly	○	○	○	○	○	○
	Sheet metal Parts	○	○	○	○	○	○
	Plastic Parts	○	○	○	○	○	○
	Machining parts	○	○	○	○	○	○
	Hardware	○	○	○	○	○	○
	Flow System Parts	○	○	○	○	○	○
	Cable	○	○	○	○	○	○
Accessories		○	○	○	○	○	○
Packaging Materials		○	○	○	○	○	○

The table is compiled in accordance with SJ/T 11364.

○: The content of toxic or hazardous substance in the homogeneous materials of the parts above is in the acceptable range of GB/T 26572.

×: The content of toxic or hazardous substance is exceed the acceptable range of GB/T 26572 in at least one kind of homogeneous material of the parts above.

(The circuit board used lead solder in machining process and some parts of the board contain plumb； And some sheet metal parts use chromium VI for surface)

Memo: Printed circuit board Assembly is consist of printed circuit board, capacitance, connector and other parts. Lithium cell is detachable and recyclable part.

Appendix 7:Specificity/Interference Study

Test item	Substances causing false negative results and concentrations	Substances causing false positive results and concentrations
Ascorbic acid	/	Sodium thiosulfate(15mg/dL), Cysteine(15mg/dL),Sodium phosphate(375mg/dL),Levodopa（10.8mg/dL）, Acetylcysteine（15mg/dL）, Ammonium chloride（2500mg/dL）
Nitrite	Ascorbic acid(33.3mg/dL), Bilirubin(60mg/dL),Creatinine（1125mg/dL）	Urobilinogen(25mg/dL),Sodium Bicarbonate(1125mg/dL),Methylamine + methylene blue（300mg/dL+52.5mg/dL）
Leukocytes	Amoxicillin（1050mg/dL）, Ibuprofen（187.5mg/dL）, Glucose（1666.7mg/dL）, pH≤4.5, SG≥1.040	Urobilinogen(50mg/dL),Methylamine + methylene blue（300mg/dL+52.5mg/dL）, Bilirubin（60mg/dL）
Ketone	Sodium Bicarbonate(750mg/dL), Glycine(337.5mg/dL),Sodium phosphate(375mg/dL),Methylamine + methylene blue（200mg/dL+35mg/dL）, Ammonium chloride（1875mg/dL）, Bilirubin（40mg/dL）	Methyldopa（100mg/dL）, Acetylcysteine（5mg/dL）, Creatinine（1500mg/dL）
Urobilinogen	Gabapentin（22.5mg/dL）,Nitrite（1.7mg/dL）	Methylamine + methylene blue（100mg/dL+17.5mg/dL）, Bilirubin（20mg/dL）
Bilirubin	Ascorbic acid（66.7mg/dL）, Methylamine + methylene blue（300mg/dL+52.5mg/dL）, Nitrite（10mg/dL）	Urobilinogen(25mg/dL)
Glucose	Lithium acetoacetate(125mg/dL), Ascorbic acid（6.7mg/dL）, Levodopa(21.7mg/dL), Methylamine + methylene blue（200mg/dL+35mg/dL）, Acetylcysteine（5mg/dL）、Bilirubin（60mg/dL）, Urea（15025mg/dL）	Peroxide(7.5%)

Protein	Amoxicillin（1050mg/dL）, Ibuprofen（125mg/dL）, Ammonium chloride（1250mg/dL） Calcium chloride（225mg/dL）	Quaternary Ammonium(100mg/dL), Sodium Bicarbonate(1125mg/dL),Gabapentin（15mg/dL） Methylamine + methylene blue（100mg/dL+17.5mg/dL）, Bilirubin（40mg/dL）, Creatinine（750mg/dL）, HGB（2500mg/dL）, Urea（15025mg/dL）
Blood	Sodium Bicarbonate(750mg/dL), Ascorbic acid（33.3mg/dL）, Furosemide（100mg/dL）, Ibuprofen（250mg/dL）, Levodopa（21.7mg/dL）	Peroxidase(10mg/dL),Glycine(225mg/dL),Biotin（3750mg/dL）, Methyldopa（33mg/dL）, Methylamine + methylene blue（100mg/dL+17.5mg/dL）
Microalbumin	Ascorbic acid（200mg/dL）, Ammonium chloride（1250mg/dL）	Quaternary Ammonium(100mg/dL),Blood(0.05%),Human immunoglobulin IgG(83.33mg/dL), Gabapentin（15mg/dL）, Methylamine + methylene blue（100mg/dL+17.5mg/dL）, Creatinine（700mg/dL）, HGB（208mg/dL）
Creatinine	Gentamicin sulphate（30mg/dL）, Ammonium chloride（104.2mg/dL）	Acetaminophen（300mg/dL）, Biotin（1250mg/dL）, Furosemide（150mg/dL）, Gabapentin（22.5mg/dL）, Acetylcysteine（5mg/dL）
Specific Gravity	Sodium bicarbonate(1500mg/dL)	Salicylic acid(450mg/dL),Uric acid(155mg/dL)
pH	/	/

Appendix 8:Emission and Immunity test case and requirement

Table 8-1 Emission test case and requirement

No.	Test case	Basic standard	Performance criterion
1	Conducted emission	CISPR 11:2015+A1:2016+A2:2019	Group 1,Class A equipment
2	Radiation emission	CISPR 11:2015+A1:2016+A2:2019	

Table 8-2 Immunity test case and requirement

Test case		Basic standard	Test Level	Performance criteria
Electrostatic discharge （ESD）		IEC 60601-1-2:2014+AMD1:2020 IEC61000-4-2：2008	Air discharge：2kV、4kV、8kV、15kV Conducted discharge：4kV、8kV	B
Electromagnetic field		IEC 60601-1-2:2014+AMD1:2020 IEC61000-4-3：2006+A1：2007+A22010	3V/m,80-6000MHz 80%AM	A
Power frequency magnetic field		IEC 60601-1-2:2014+AMD1:2020 IEC61000-4-8：2009	3A/m,50Hz	A
Voltage dips	0%	IEC 60601-1-2:2014+AMD1:2020 IEC61000-4-11：2020	0.5/1 cycle 0%	B
	40%		5/6 cycles 40%	C

	70%		25/30 cycles 70%	C
Voltage interruptions		IEC 60601-1-2:2014+AMD1:2020 IEC61000-4-11：2020	0%,Duration:250/300 cycles	C
burst		IEC 60601-1-2:2014+AMD1:2020 IEC61000-4-4：2012	1kV，100kHz	B
Surge		IEC 60601-1-2:2014+AMD1:2020 IEC61000-4-5：2014+A1：2017	Line to Ground：1kV Line to line：0.5kV	B
Conducted RF		IEC 60601-1-2:2014+AMD1:2020 IEC61000-4-3：2013	3V,0.15-80MHz 80%AM with 1kHz	A